ENGINEERING NEWS-RECORD

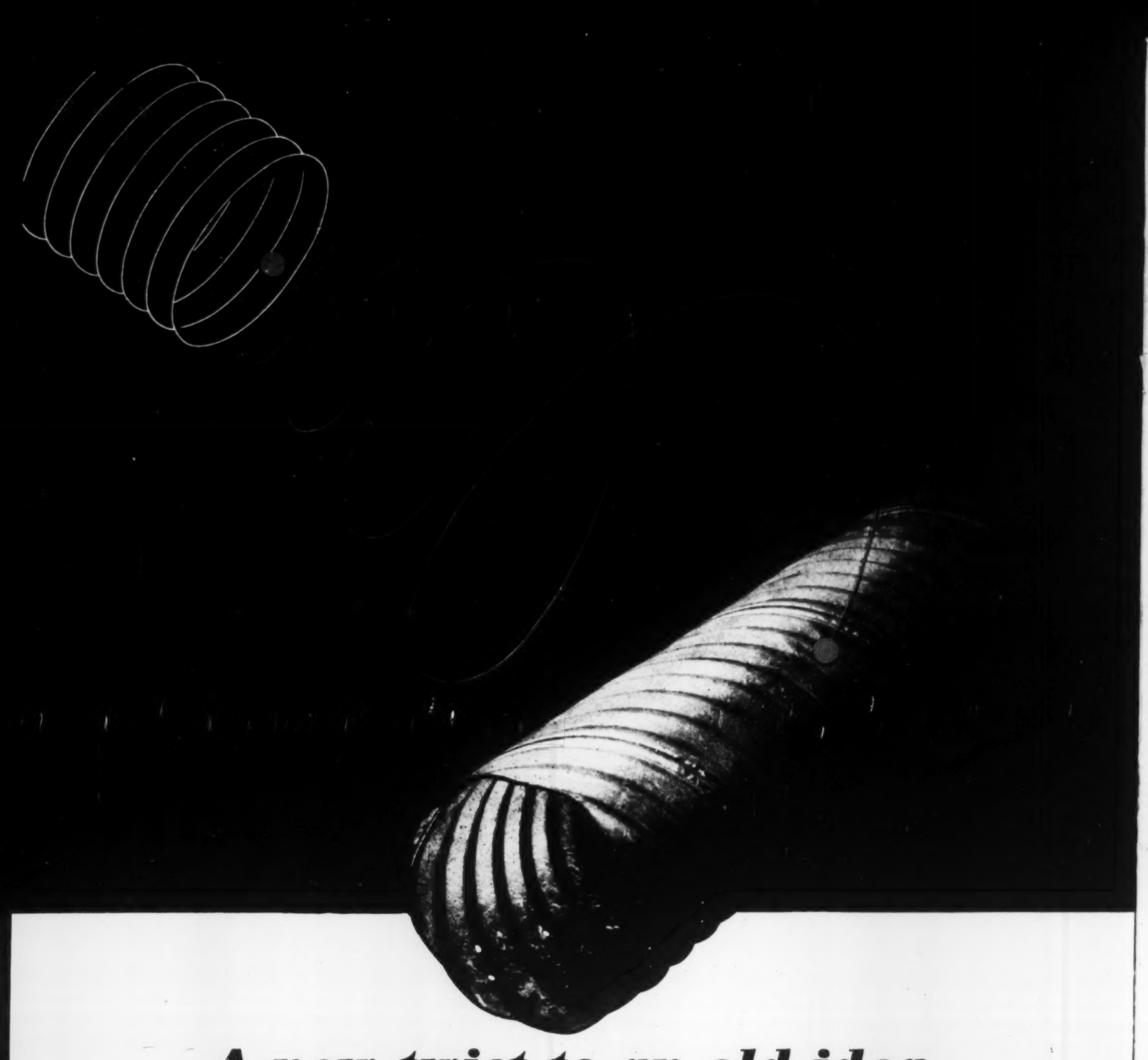
A McGRAW-HILL PUBLICATION

APRIL 28, 1949

Steel strut goes into place on railroad bridge, as structure is rebuilt without interruption of normal traffic

• • •

ECONOMICAL DESIGN METHODS FOR FLEXIBLE PAVEMENTS



A new twist to an old idea

Corrugated metal pipe had long been known as a low-cost, efficient and dependable drainage structure. Could a new twist be given this old idea to make it even better for certain uses? ARMCO Engineers said: "Yes."

They developed an automatic machine to make corrugated metal pipe by a continuous process. The result was ARMCO HEL-COR—a new kind of pipe with helical corrugations and offering exceptional economy in small diameters. ARMCO HEL-COR Pipe proved ideal for subdrainage and similar applications. It is low in cost to permit extensive use, easy to handle, durable, and has ample corrugated metal strength. No crushing, cracking or disjointing under the impact and vibration of heavy loads. Thousands of installations have brought lower maintenance and greater safety to highways, railways and airports.

Providing better and more economical products to meet specific needs has been standard practice at Armco for more than 40 years. Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

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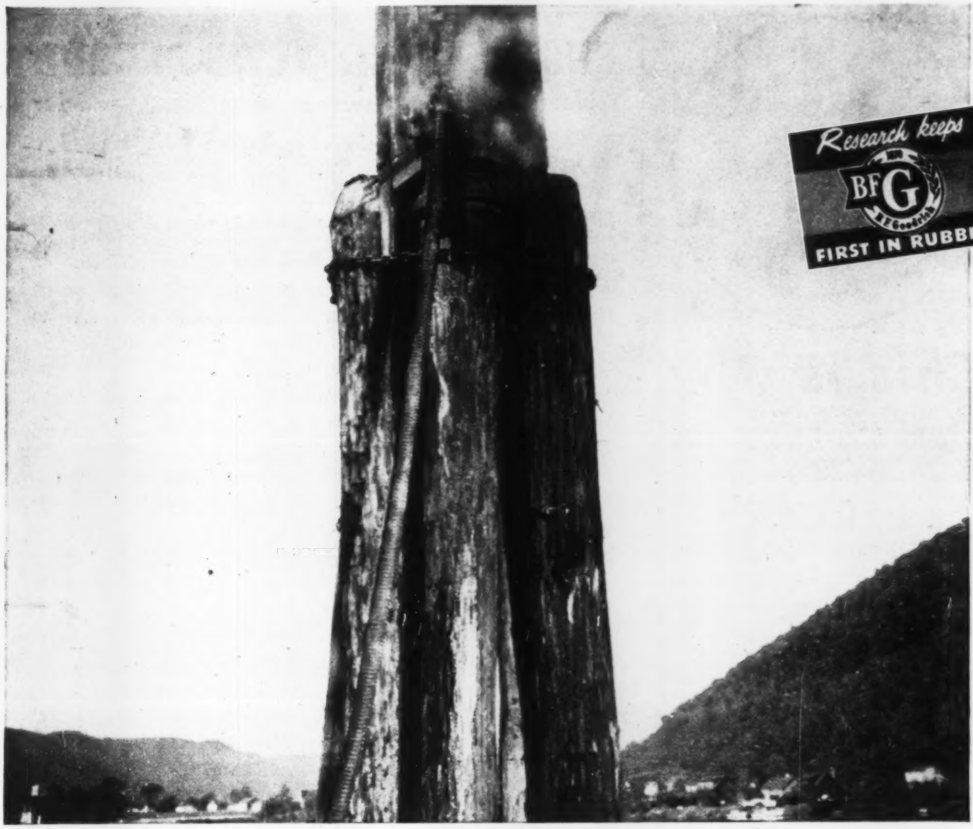

Ends hazards of scalding and injury from bursting hose wall

B. F. Goodrich Burstproof hose can't be burst by steam

BURSTPROOF steam hose (developed and perfected by B. F. Goodrich) is accurately named—*it is completely burstproof.* Steam or steam pressure cannot burst the hose wall; this hose can only be ruptured by a blow from outside that actually *cuts* the wire reinforcement.

Burstproof hose has no cotton fabric to burn, char, and give way. High-tensile steel wire takes the place of the fabric plies, which in other hose burn and then collapse. Here is a hose as strong and safe as steam hose can be made.

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Armored with steel—The steel wire reinforcement is braided at the angle of greatest strength. Multiple wire strands are paralleled, to give more strength than a woven tape. Braid openings permit the wire braid to "rivet" itself to the layers of rubber, thus increasing strength and safety. Wire winding in the larger sizes is useful in resisting sharp bends or kinks.

BFG Burstproof is the safest, strongest hose in steam service. Recommended especially for saturated steam pressures up to 200 p.s.i., for superheated steam up to 388° F., and for all applications that are hard on steam hose. See it at your local distributor or write: *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

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ENGINEERING NEWS-RECORD

VOLUME 142 APRIL 28, 1949 NO. 17

WALDO G. BOWMAN
Editor

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Take a look at these pictures if you are figuring on rock work. Here is the beginning of the rock work on the $100,000,000 project which will eventually be the 4th largest and the 5th highest dam in the country.

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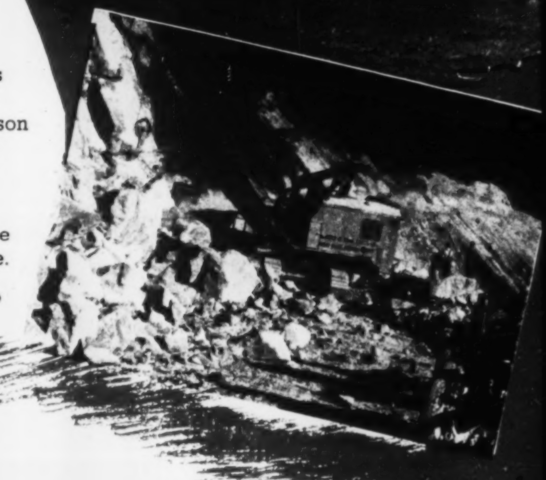

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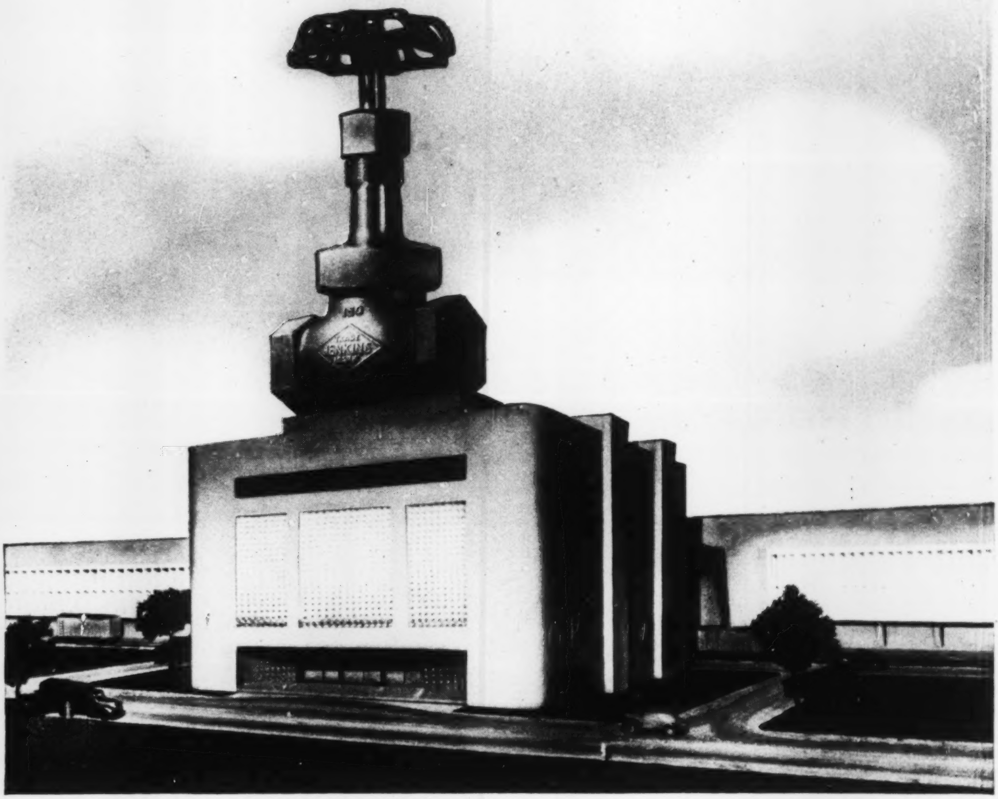

There's Truth in this "Tall Story"

IF YOU THINK of *all valves* in this plant as *one valve*, you'll see the truth in this trick photo. Valves, collectively, represent one of the biggest investments in equipment in any plant.

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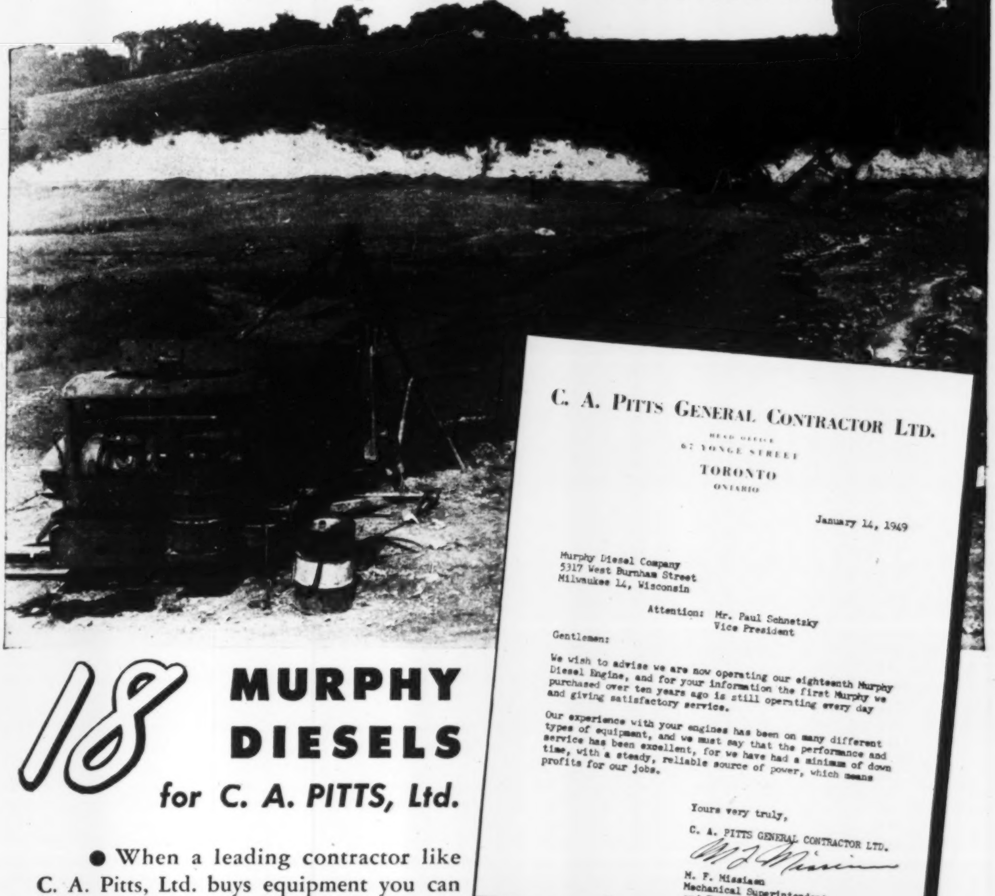

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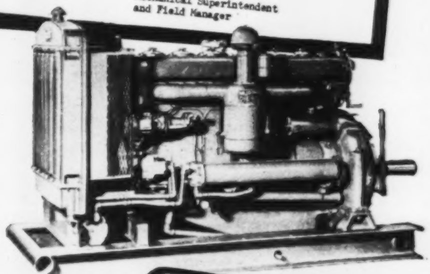

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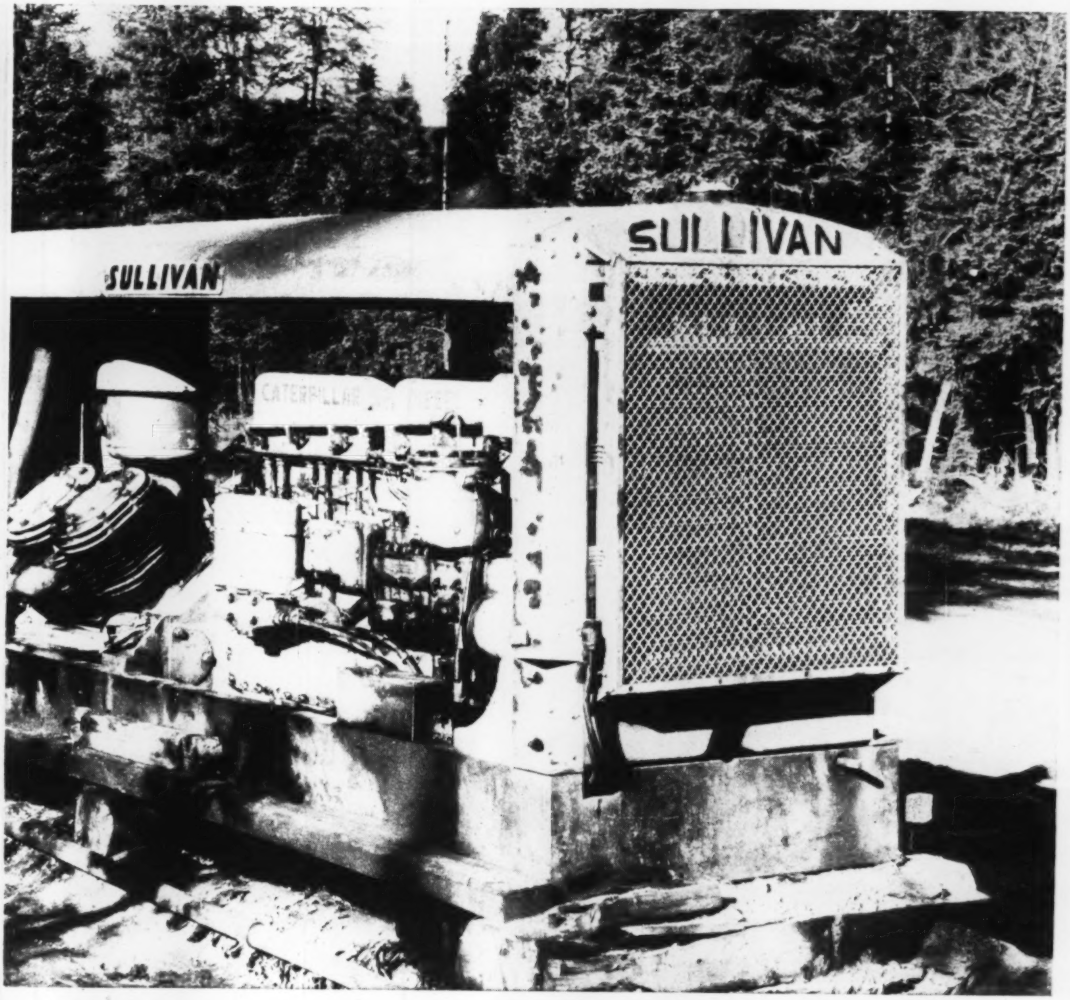
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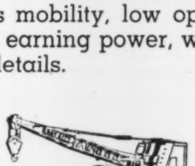

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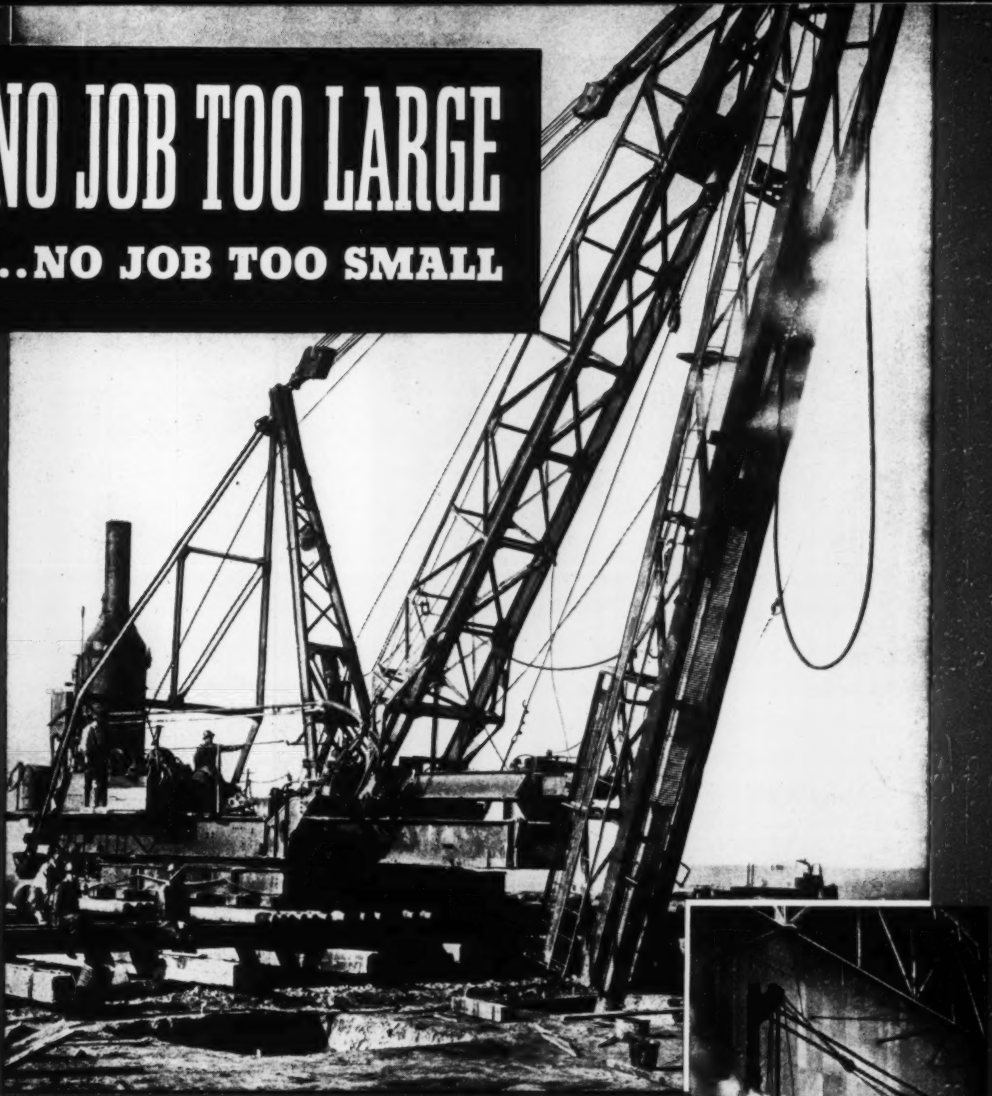

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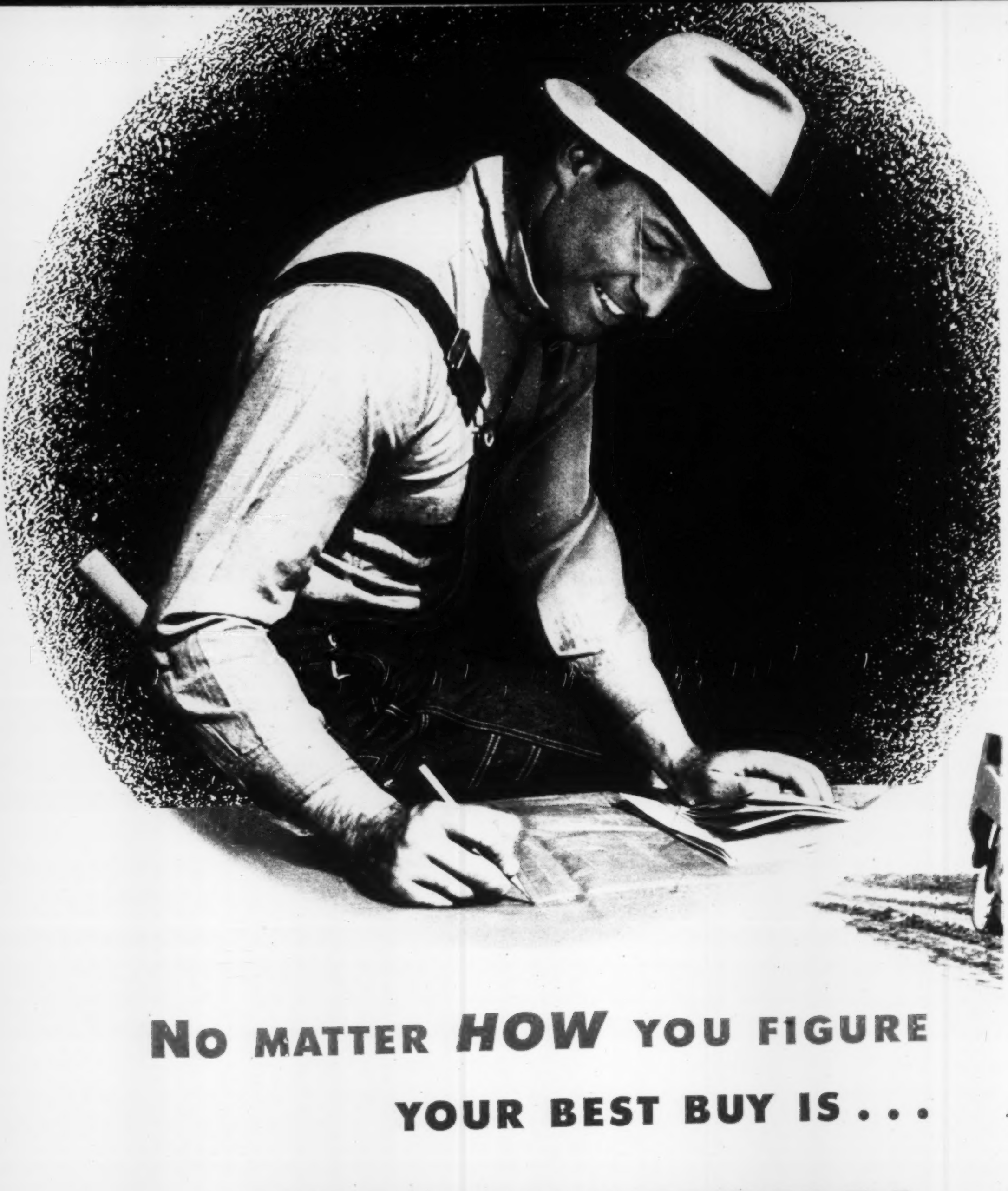

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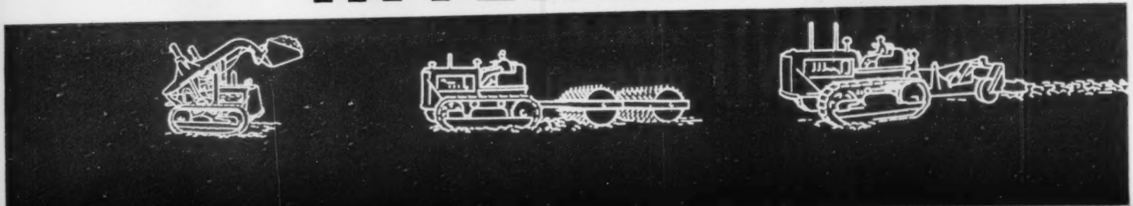

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Used	272.25 Gals.
Remaining	15.75 Gals.
OIL: Carried	7.5 Gals.
Used	1.5 Gals.
Remaining	6.0 Gals.
EXTRA DISTANCE POSSIBLE ON FUEL UNUSED	372 Miles
AVERAGE GROUND SPEED, distance flown	146.3 MPH
AVERAGE MILES PER GALLON, distance flown	19.37 MPG
AVERAGE GALLONS PER HOUR	7.56 GPH
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Made in all standard diameters from 16" to 150", Lock Joint Pressure Pipe is designed for all pressures common to American water works practice.

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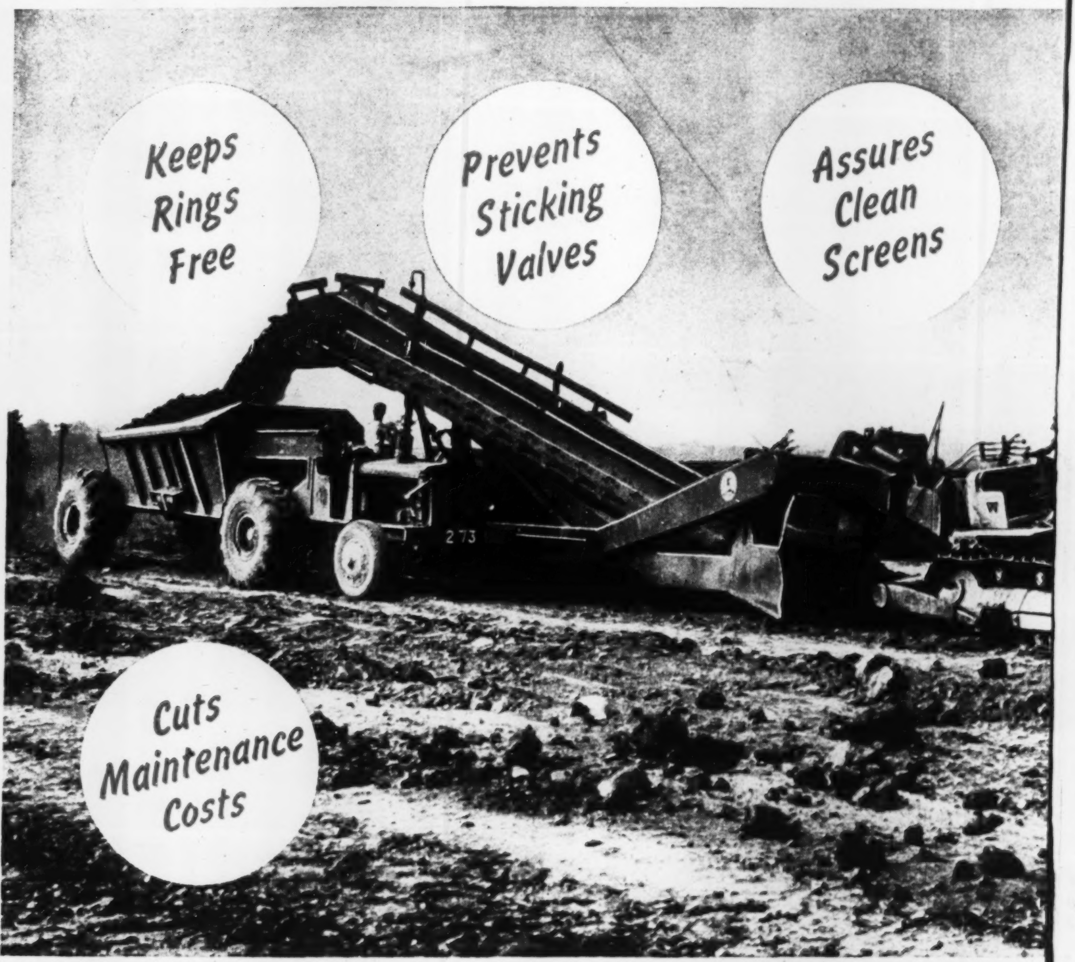
PRESSURE PIPE

SINCLAIR TENOL Engines Clean


Keeps Rings Free
Prevents Sticking Valves
Assures Clean Screens
Cuts Maintenance Costs
273

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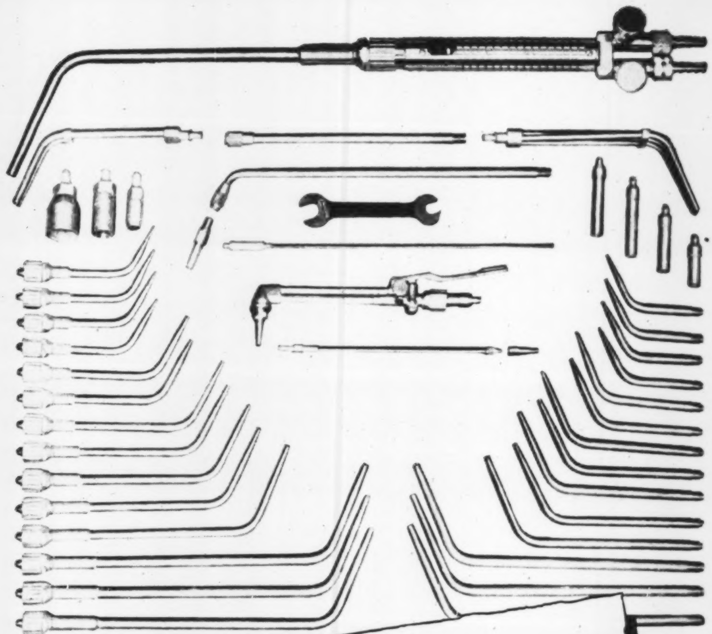

Here is Airco's **New** Torch for **Heavy Duty** welding... heating... brazing

The new Airco 800 Torch is designed for tough, *heavy-duty* jobs. As shown in the illustration, the torch operates with a complete range of welding tips (with or without individual mixers) as well as heating, brazing and a variety of tips for other uses. No other torch can offer this wide operating range.

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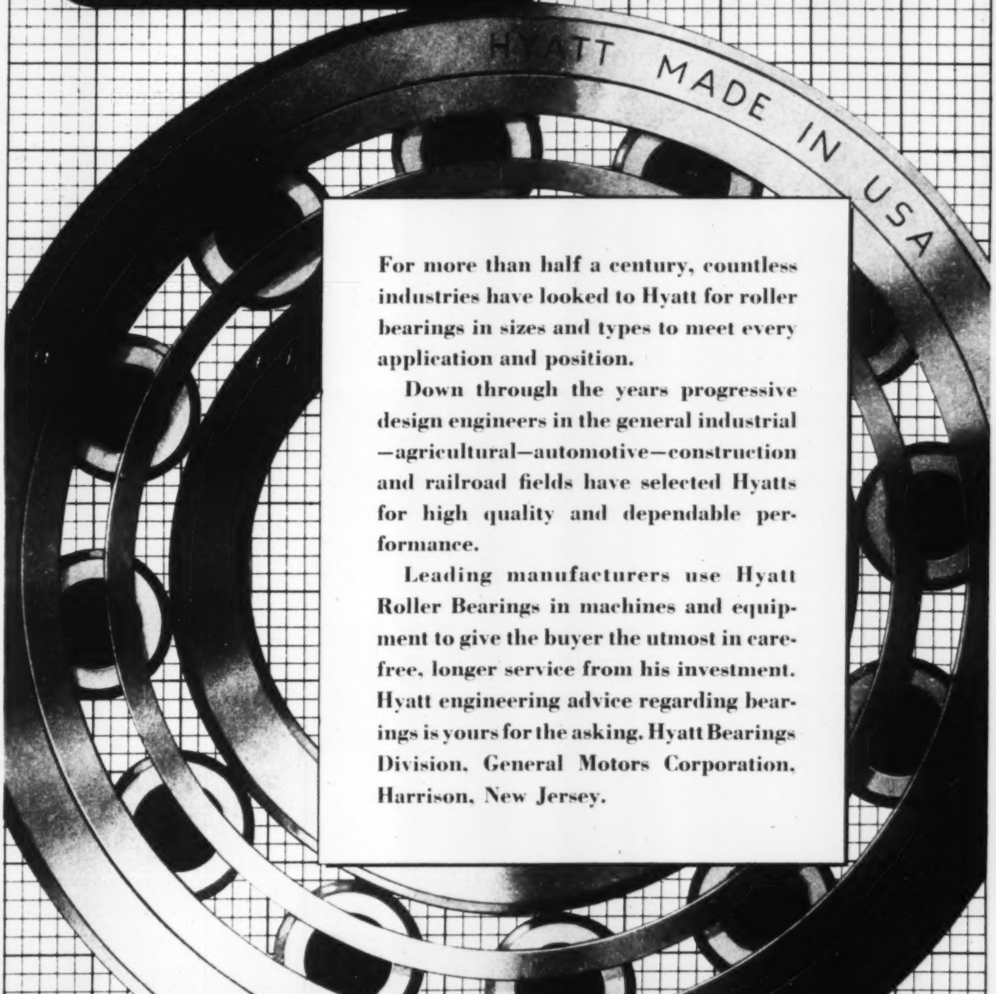

For more than half a century, countless industries have looked to Hyatt for roller bearings in sizes and types to meet every application and position.

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HYATT ROLLER BEARINGS

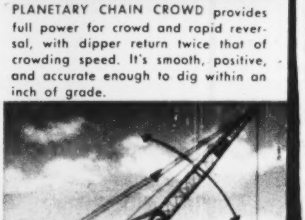
How P&H PLANETARIES Pep Up Production

This is the planetary transmission used so effectively on P & H Excavators. Through the use of this simple, proved principle, P & H provides operating characteristics which are unmatched for speed, smoothness and accuracy of control.

Where frequent reversals are required, such as for shovels or for the main drum in crane service, the planetary provides remarkable flexibility, yet delivers full power as positively as a gear.

P & H originated and patented the application of the planetary transmission on excavators and has always led in its development. Its various uses, explained here and on the following page, constitute another important P & H Added Value.

PLANETARY CHAIN CROWD provides full power for crowd and rapid reversal, with dipper return twice that of crowding speed. It's smooth, positive, and accurate enough to dig within an inch of grade.



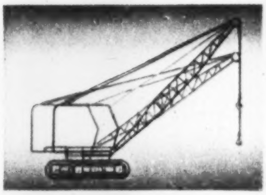
PLANETARY BOOM HOIST is independent—triple safe. Safety lowering against engine compression makes it impossible for the boom to drop suddenly.

and in crane service . . .

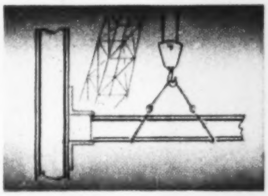
PLANETARY CONTROL

means safer, faster, more accurate load handling

Here's an operating feature you'll find on no other crane—planetary raising of both boom and load, together or independently. It is quick, easy and safe. And with load lowering against engine power, there's greater accuracy for "inching" heavy loads where utmost precision is required.

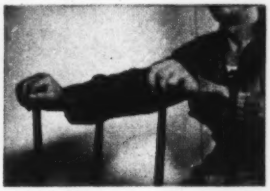


HERE'S A BIG ADVANTAGE in work such as steel erection. Operator can raise boom and load as machine moves forward, without forward motion of the boom point.



BOOM AND LOAD can be lowered smoothly, steadily, without jerking. This permits more precise handling of heavy members such as in fitting up structural steels.

COMPLETE SAFETY. Holding brakes are supplemented by ratchet mechanism which automatically prevents lowering boom faster than engine speed. Like coasting your car downhill in low gear.



EASY OPERATION is provided through simple, positive hydraulic control; more responsive. The operator reacts naturally with direct "feel" of the load at all times.

Look To
P&H
For Added Values

The P & H planetary transmission is the simplest, most compact mechanism for these Crane functions. There are no exposed gears, no stub shafts, no extra clutches.

P & H design and construction offer many other important added values to the excavator buyer. Ask your nearest P & H dealer about them or write us for complete information.

P&H Excavators are built in sizes from 3/8 to 6 cu. yds. with gasoline, Diesel, or electric power. Ask for bulletins on the size that interests you.

P&H

EXCAVATORS

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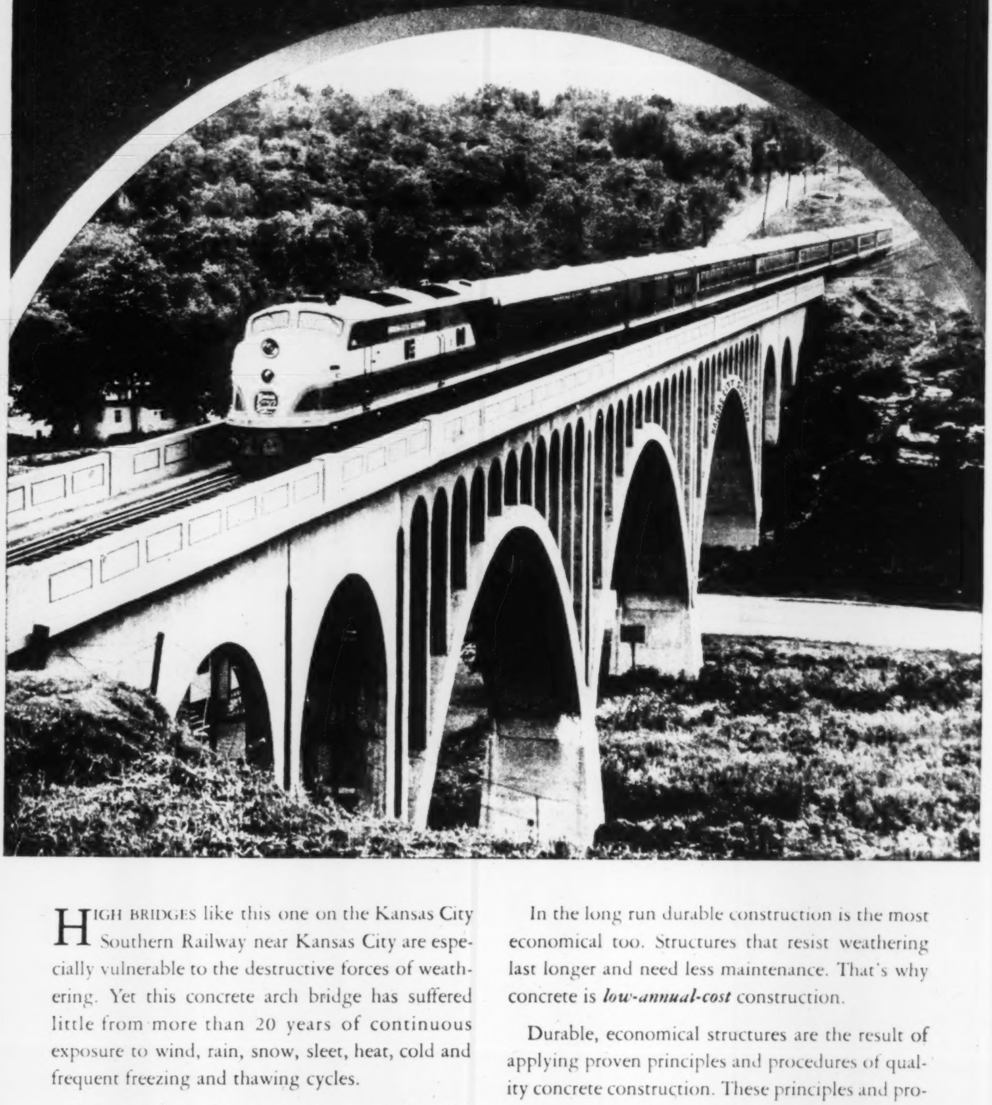
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

QUALITY CONCRETE
for enduring, economical structures



HIGH BRIDGES like this one on the Kansas City Southern Railway near Kansas City are especially vulnerable to the destructive forces of weathering. Yet this concrete arch bridge has suffered little from more than 20 years of continuous exposure to wind, rain, snow, sleet, heat, cold and frequent freezing and thawing cycles.

Such resistance to weathering is typical of quality concrete construction. Concrete structures can be designed to withstand any natural wearing action—underwater, underground or in the atmosphere.

In the long run durable construction is the most economical too. Structures that resist weathering last longer and need less maintenance. That's why concrete is ***low-annual-cost*** construction.

Durable, economical structures are the result of applying proven principles and procedures of quality concrete construction. These principles and procedures are fully described in a new 70-page illustrated book, "*Design and Control of Concrete Mixtures.*" Write for your free copy today. It is distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION

DEPT. A4d-17, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

"We're positively agitated!"

"We're the Sludge Blanket Particles in the Permutit Precipitator that save 40% on chemicals, 75% in time!"

The Permutit® Precipitator offers you a new and more efficient means of removing impurities from your water! It does this by precipitation, adsorption, settling, and upward filtration. It requires less time, less chemicals, and up to 50% less space than any previous design of reaction and settling tank!

The Precipitator's unique sludge blanket is the chief reason for its amazing efficiency. Positive agitation assures a thorough mixing of water and chemicals. In the filter zone, the sludge blanket is kept fresh and active at all times. A photoelectric blow-off control assures a proper removal of sludge for varying flow and dosage rates. The sludge blanket level thus remains constant.

For full information concerning this precipitator, write to The Permutit Company, Dept. ENR-5, 330 West 42nd Street, New York 18, N. Y., or to the Permutit Company of Canada, Ltd., Montreal.

★ ★ ★

See These Benefits: LENGTHENED FILTER RUNS • LOW TURBIDITY • SHORT DETENTION TIME • ADAPTABLE TO VARIABLE FLOW RATES

Permutit

WATER CONDITIONING HEADQUARTERS FOR 35 YEARS

Truscon Ferrobord Steeldeck

for curved

pitched

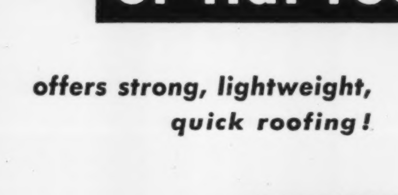
or flat roofs

offers strong, lightweight, quick roofing!

Truscon Ferrobord members are so designed and formed that each unit firmly interlocks with the adjoining unit along the full length, thereby achieving the maximum in lateral distribution of concentrated loadings. The members are fabricated in units long enough to span over three or more purlin spacings (maximum length recommended for economical fabrication 32 ft. 0 in.). The deck may therefore be considered as a continuous beam instead of a simply supported beam, with the consequent increase of 25% in carrying capacity. End joints in members are so staggered that no two adjoining units are spliced or butted over the same purlin.

In erecting the deck, as each individual unit is laid in place, it can be either clipped or welded to the supporting framework. The narrow width of the deck unit permits each piece to be fastened to its support at each rib. The work is done from above precluding the necessity for the use of scaffolding or movable stages during erection.

Ferrobord is manufactured from both 20-gage and 18-gage copper-bearing strip steel, having a yield strength of not less than 33,000 lbs. per sq. in. Each unit is 6 in. wide and has a depth of either 1½ or 1¾ in.



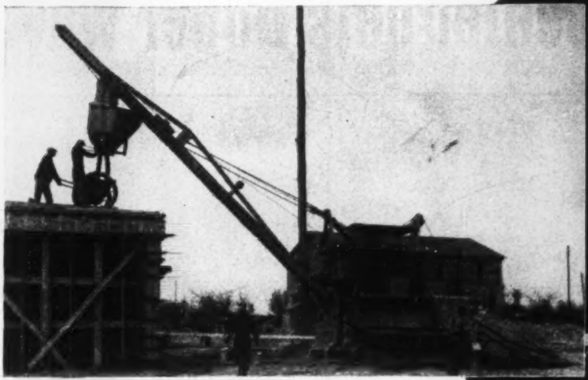
1½-in. Ferrobord deck may be shop curved to a minimum radius of 60 ft. 0 in. and the 1¾-in. deck to a minimum radius of 75 ft. 0 in.

The Truscon Steel Company maintains branch offices in many of the large cities, and the services of Truscon engineers are available for assistance in the laying out of the steeldeck. Write for free descriptive literature.

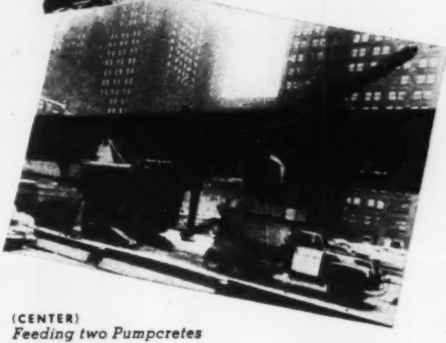
TRUSCON
STEEL COMPANY
YOUNGSTOWN 1, OHIO
Subsidiary of Republic Steel Corporation

Manufacturers of a Complete Line of Steel Windows and Mechanical Operators • Steel Joists • Metal Lath • Steeldeck Roofs • Reinforcing Steel • Industrial and Hangar Steel Doors • Bank Vault Reinforcing • Radio Towers • Bridge Floors.

HOW WOULD YOU DO THESE JOBS?



This machine is alternating between pouring to forms and loading concrete buggies. No ramps or cranes required.



(CENTER)
Feeding two Pumpcretes on a sewer job.

(ABOVE)
Loading a concrete truck on a subway job.

HERE are simple every day pouring jobs on which time and money can be saved over ordinary methods. A MultiFoote Paver with the HighLift Boom and MultiFeed Bucket will pour right to forms or conveying equipment and eliminate mixer, crane, false work and in many cases elevator or hoisting equipment.

It assures more uniform delivery of concrete, saves time for concrete buggy men, and makes possible the direct charging of Pumpcrete machines or concrete trucks.

Your MultiFoote HighLift Boom has a lift of 23 feet with clearance under the bucket and your MultiFeed Bucket will deliver a shovelful or a barrowful. Here is a better answer to your retaining wall, one story building wall, abutment construction and concrete footing problems. Your MultiFoote gives you new versatility in job bidding.

Ask for the booklet *"How Would You Do These Jobs?,"* showing how the HighLift Boom has simplified pouring jobs. Don't plan your next contract without looking into the HighLift Boom!

THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
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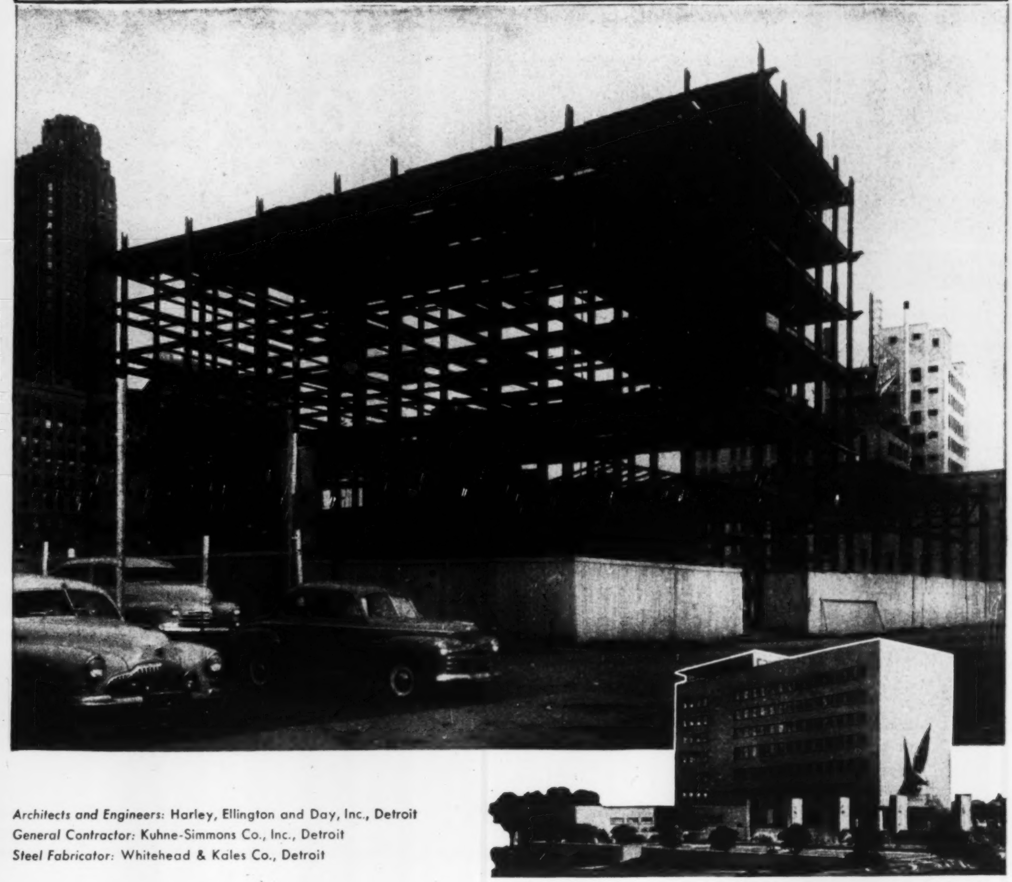
MULTIFOOTE

A BLAW-KNOX PRODUCT
FROM FORMS TO PAVER TO FINISHER... ALL YOUR PAVING EQUIPMENT
IN ONE PACKAGE from BLAW-KNOX

THREE SIZES
27-E Singlemix (Single drum)
34-E Singlemix (Single drum)
34-E Duomix (Double drum)

HIGH LIFT BOOM
TRADE MARK

Detroit's Civic Center gets under way



Architects and Engineers: Harley, Ellington and Day, Inc., Detroit
General Contractor: Kuhne-Simmons Co., Inc., Detroit
Steel Fabricator: Whitehead & Kales Co., Detroit

This is the Veterans Memorial Building, first structure to take shape for Detroit's new 16-block Civic Center along the Detroit River. The L-shaped building consists of a ten-story main structure, with penthouse, and a two-story wing. Besides offices for veterans' organizations, it will include meeting rooms, a cafeteria, dining rooms and banquet room, plus a 100 ft x 65 ft ballroom. It is to be air-conditioned, and will be faced with white marble.

Like so many other enduring structures, the Veterans Memorial Building has a steel framework of Bethlehem Structural Shapes.

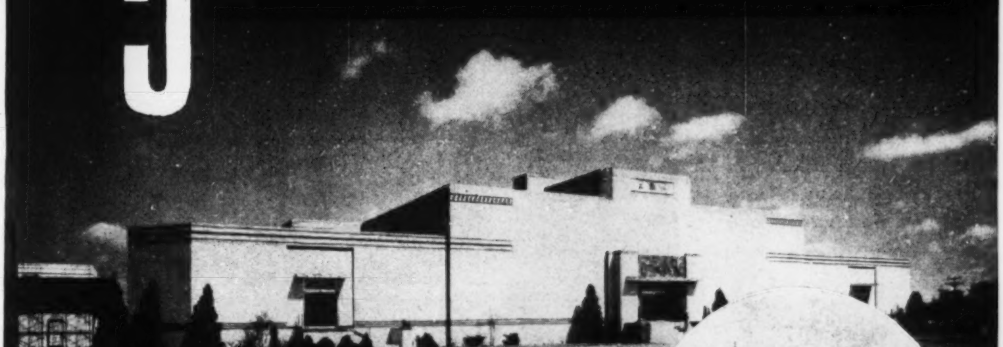
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
***Export Distributor:* Bethlehem Steel Export Corporation**

Bethlehem
STRUCTURAL SHAPES

★ BETHLEHEM STEEL ★

5 MAIN REASONS WHY B. F. GOODRICH CHOSE FIBERGLAS ROOF INSULATION



Application of Fiberglas Roof Insulation at B. F. Goodrich Co. research center, Brecksville, Ohio

1. **HIGH THERMAL EFFICIENCY.** In the 13/16″ thickness, the thermal conductance of Fiberglas* Roof Insulation is only .33 (at 75° F. mean temperature). In the 2″ thickness, it is an exceptionally low .14.
2. **IMMUNITY TO MOISTURE.** This long-life insulation will not rot. Its core material is made of ageless glass fibers. In an accelerated wet and dry, hot and cold cycle weathering test by an independent laboratory, Fiberglas Board retained the characteristics of a satisfactory insulation after the equivalent of 75 years of such weathering.
3. **DIMENSIONAL STABILITY.** Fiberglas Insulation will not swell, shrink, warp or buckle. It provides a firm, dependable base for a built-up roof.
4. **LIGHTWEIGHT.** In the 13/16″ thickness, Fiberglas Insulation weighs only 1.15 lbs. sq. ft. In the 2″ thickness, 2.19 lbs. sq. ft.
5. **COMPETITIVE PRICE.** Fiberglas Insulation is competitive in price with most ordinary roof insulations, costs no more to apply.

JOB DATA

Engineers: B. F. Goodrich engineering staff.

Building Contractor: Carmichael Construction Co., Akron, Ohio.

Roofing Contractor: Industrial Roofing & Sheet Metal, Inc., Cleveland, Ohio.

Slope: ½″ per ft.

Roof Deck: Poured concrete.

Roofing: Tar and gravel.

Insulation: Fiberglas; 15,000 square feet, 2″ thick; 8,600 square feet, 13/16″ thick.

Only Fiberglas Roof Insulation gives you all these advantages

For your insulated roofs, be sure to specify Fiberglas Roof Insulation. Applied by leading roofing contractors, coast to coast. Owens-Corning Fiberglas Corporation, Dept. 952, Toledo 1, Ohio. In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

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FIBERGLAS
T.M. REG. U.S. PAT. OFF.
BUILDING MATERIALS

*FIBERGLAS is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers.

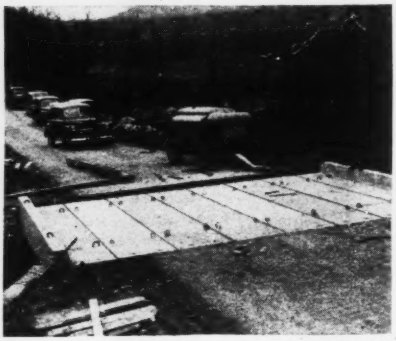
BUILDING INSULATION · ACOUSTICAL TILE AND BOARD · ROOF INSULATION · MEMBRANE FABRIC · ALSO BASIC MATERIALS FOR SIDING, ETC.

Precast Bridges

Setting precast bridge members in place . . . new, permanent bridge installed in less than 3 hours. Guard rail and wearing surface placed later.

Pennsylvania Highway Department replaces outmoded bridges on secondary road system with precast concrete structures

Members fabricated with 'Incor' Air-Entraining Cement



ON THE alert for ways and means of reducing today's construction costs, the Concrete Products Co. of America, in cooperation with the Pennsylvania Department of Highways, has developed a method of precast concrete bridge construction which is producing outstanding results. Following exhaustive tests, 14 bridges, with spans up to 24 ft., have been ordered in the last few months, and spans up to 36 ft. are now contemplated.

As the Pennsylvania Department of Highways uses air-entraining cement in highway construction, the Department approved the use of 'Incor'* Air-Entraining 24-Hour Cement in fabricating the bridge members. Faster, thorough curing and quicker re-use of specially designed forms helped speed economical production. Vacuum process was used to reduce water content of the placed concrete.

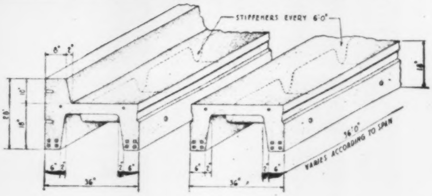
With literally thousands of bridges throughout the country in need of replacement, this speedy, economical method of minimizing traffic disruption and lengthy detours has a tremendous field of usefulness.

*Reg. U. S. Pat. Off.

Owner: **PENNSYLVANIA DEPARTMENT OF HIGHWAYS**

Precast bridge members fabricated by: **CONCRETE PRODUCTS CO. OF AMERICA**

Philadelphia, Pottstown, Pittsburgh, Williamsport, Pa.


STIFFENERS EVERY 6'0"
8"
2"
10"
18"
28"
6"
2"
2"
6"
36"
6"
2"
2"
6"
36"
18"
36'0"
VARIES ACCORDING TO SPAN

LONE STAR CEMENT CORPORATION
LONE STAR PORTLAND CEMENT
'INCOR' HIGH EARLY STRENGTH PORTLAND CEMENT
"INCOR"
LONE STAR AIR-ENTRAINING PORTLAND CEMENT
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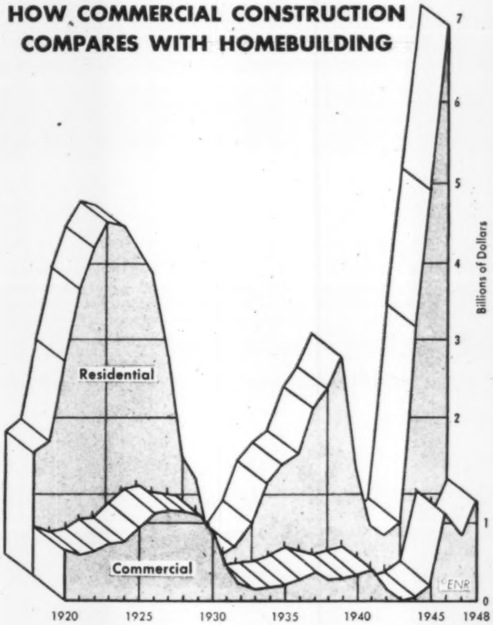
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,000,000 BARRELS ANNUAL CAPACITY

HOW COMMERCIAL CONSTRUCTION COMPARES WITH HOMEBUILDING



Will commercial construction boom?

Homebuilding has had one of its greatest booms since the end of World War II. But have we had the commercial construction—warehouses, offices and loft buildings, stores, restaurants, and garages—to go with the new housing?

The country-side is dotted with new housing developments and many of them as yet do not have the complement of stores, filling stations and bus terminals that have developed in older communities. Those older towns, too, in many cases need a major face-lifting operation along Main Street. Particularly in the East, many cities have business districts that still look pretty much as they did twenty years ago—while rows of new houses fill out residential districts.

All this poses the question: What's happened to commercial building? And what are the chances for a boom in construction in business districts?

The chart, based on Department of Commerce figures, reveals several things:

1. Commercial construction generally moves up and down about the way residential building does—but its fluctuations are not nearly as great in magnitude.

2. After booming in the late 1920's, commercial construction skidded and held to a low level through the '30s and early '40s. War brought it down to virtually nothing.

3. Commercial construction got going fast at the end of the war—only to have a crimp put in it by the postwar restrictions on construction. Commercial building probably was cut more by materials allocations and priorities than any other type of building.

So—how do we stand on commercial construction today?

The answer depends on what happens to general business, of course. But two things seem clear:

First, we are probably a long way behind in supplying the U. S.'s needs for commercial buildings. This boom hasn't seen anything like as much commercial building as was done in the '20s. The chart comparison is far more striking when you allow for the fact that construction costs have more than doubled since 1925.

Second, there's a good possibility that commercial building will continue to grow in volume, even if homebuilding volume turns down. The chart shows that home-building hit its peak in 1925, for example, while the peak in commercial construction came in 1927 and 1928. Apparently, the houses are built first, then come the stores to supply the new neighborhood.

Needs for new construction are only part of the commercial building prospects. As far as we know, no national organization has ever studied the nation's needs for rebuilding and replacement of existing commercial buildings. Market and business districts in the major cities—many of them generations-old—and shabby stores almost everywhere clearly show there's a multibillion dollar market for construction there.

How much of this business there will be depends partially on costs—and how far the construction industry can bring them down. More important in developing commercial construction, however, will be returning competition—which forces merchants to modernize in order to attract customers. As things look now, the return of old-fashioned competition will bring more and more alert businessmen to wanting to revamp their places.

In short, there's a good possibility that commercial construction will run on at about today's $1.5 billion-a-year level through 1949 and perhaps higher in 1950. Beyond that, there's a huge unexplored market—if continuing good business makes it attractive to rebuild and replace out-dated buildings.

Hi-BOND
Reinforcing Bars

Contractor reports that Hi-Bond from Ryerson stocks, used exclusively on this job, simplifies tying, yet gives firmer framework, because of gear-like contact between scientifically designed bars.

Large Stocks of Reinforcing Bars

Available for Quick Shipment from Ryerson

Now you can put the smoothly efficient combination of Ryerson reinforcing bar stocks and Ryerson reinforcing service to work for you. From the wide range of sizes on hand you can get quick shipment of most any reinforcing requirement.

Ryerson handles the complete job from setting plans to delivery with speed and accuracy. Bars are cut, bent and correctly tagged for easy placement. Deliveries are scheduled to the changing needs of the job.

In Chicago, Detroit, Cincinnati and Los Angeles, Ryerson stocks include the unique Hi-Bond bar, scientifically designed to give a greater bonding grip in concrete. Hi-Bonds test-proven grip means better, stronger construction and an increased resistance to the formation of tensile cracks.

You can save time by calling Ryerson for every other construction steel, too. Our stocks include structurals, plates, structural tubing, steel spirals, forms for concrete joist construction—in short, everything in steel. One call covers all your requirements. So for Hi-Bond reinforcing and every kind of steel, contact your nearby Ryerson plant.

NEED WELDED WIRE MESH?
Call us now for immediate shipment of welded wire fabric before summer building activity depletes our stocks. Every standard gauge and size on hand in plain and galvanized wire.

RYERSON STEEL

Joseph T. Ryerson & Son, Inc. Plants at: New York • Boston • Philadelphia • Detroit • Cincinnati • Cleveland
Pittsburgh • Buffalo • Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco

THE CONSTRUCTION WEEK

LEGISLATIVE PROBABILITIES—Congressional lawmaking machinery—grinding along slowly enough in the first 100 days of the 81st Congress—is beginning to spin at a faster rate. Pundits viewing the President's much-harried program as presented to the legislative body, rate chances for components about like this:

A new labor law will be passed with the Thomas bill amended, but not so much that organized labor will be annoyed.

Public Housing—The entire Wagner-Ellender-Taft bill will go through.

Social Security—Coverage will be broadened, increasing payroll taxes 1½ percent on both employer and employee.

Taxes—Depend on expenditures finally authorized for fiscal 1950.

Economic Controls—There won't be any price controls, nor any mandatory priorities or allocations controls.

Public Power—Reclamation will go ahead to build transmission lines.

Foreign Policy—Truman's whole program will go through.

ANSWER THAT ONE!—Ralph T. Walker, newly-elected president of the American Institute of Architects, has hit back at critics who cite the automotive industry as an example of how building construction costs could be cut by mass-production methods. To the question "Where is the low-priced house that mass-production should make possible?", Mr. Walker has a simple answer: "Where is the low-priced car?"

CREDIT CURBS ENDING—The Federal Reserve Board's emergency powers to curb credit are now seen certain to expire by June 30. FRB is already asking Congress to extend its authority—but Congressmen have already expressed the conviction that no credit curb extension is necessary in a period where credit is contracting anyway.

SYNTHETIC BUG KILLER—A development hailed by government chemists as comparable with the synthesis of rubber came out from under its wraps recently—a pyrethum-like chemical for control of insect pests. Developed after 15 years of work by chemists of the Bureau of Entomology and Plant Quarantine of the Agriculture department, the development is seen as the beginning of chemical control of insects. Pyrethum (one of the oldest known insecticides) is obtained with great difficulty from certain plants that grow in Japan and the Belgian Congo, among other places. Chemical production will make more available, cheaper.

NEW BRIDGE?—Sparked by a committee of local residents, plans are being proposed for a second interstate bridge between Portland, Ore., and Vancouver, Wash. Local boosters, presenting their suggestions to state highway commissions, said the present bridge is already carrying peak loads, and will be inadequate when a new freeway on the Washington side is completed. Both highway commissions expressed willingness to talk the matter over.

MORE ROAD BIDS—Bolstering reports (ENR April 7, p. 11) of bids below estimates and increasing interest as prices steady, Minnesota reported that in its biggest road letting since before the war it had received 133 bids on $1,700,000 worth of work—and low bids reflected a drop under a year ago.

POLLUTION CONTROL BARRIER?—Legalisms may stymie legislative action this year on Californa's water pollution control program (ENR Feb. 24, p. 14). State officials and legislators are in agreement that more stringent control is needed—particularly to protect groundwater supplies—but differ widely on the administrative form for carrying out the suggested program.

TRANSPORT FOR AFRICA—Portugal is calling a meeting in Lisbon next month to explore the possibility of U. S. aid (technicians and know-how) for transportation in central Africa. Invitations have already gone out to the U. S., France, Belgium, Britain and the Union of South Africa. Portugal now controls the important rail outlets of big mineral areas, and wants to expand transportation systems in the interior to feed its ports.

POWER FOR SOUTHWEST—Backed by a bipartisan group of senators, Sen. Robert Kerr of Oklahoma has introduced legislation proposing stepped-up power developments in eight southwestern states. Kerr would have a special study made of the area's power resources, with an eye toward development paralleling the Pick-Sloan plan for the Missouri Basin. River basins to be studied would be those of the Arkansas, White and Red rivers.

CONTROL CUTTING AND SCORING *at the Source*

- Save up to 33-1/3% in materials, replacements, labor
- Get smooth finish—perfect 90° angles without cracking surrounding areas
- Cut at an average cost of only 5 to 10 cents a foot
- Cut 3 to 5 times faster than customary methods
- Trained operators not needed—only one man operation
- Easy job to job transportation
- Depth of cut easily controlled
- Scoring can be done up to 3" in depth
- The same blade cuts both asphalt and concrete

CONTROL in cutting and scoring concrete or asphalt need not be a problem.

You can have perfectly controlled areas through use of Backlin Stratedge Concrete Cutter. Instead of breaking over the line you fracture the concrete or asphalt exactly to the point designated. You even control the area to sharp corners.

Remember that prescoring or cutting of asphalt or concrete in the beginning saves future maintenance costs in all types of work. The Backlin is safe, dependable, and of practically fool-proof construction. It is light weight and easy to handle. The Backlin—a properly engineered combination of machine and diamond wheel—has fully proved its ability in service. A glance at the illustrations shows how users of the Backlin get perfect results.

Backlin STRATEDGE CONCRETE & ASPHALT CUTTER

Some Distributorships Available

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PAUL M. COLE CO.
National Distributor

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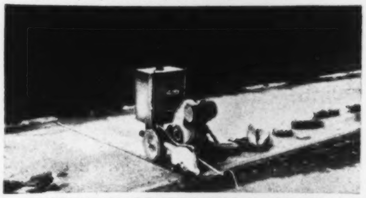
30 N. LaSALLE STREET
Chicago 2, Ill.

ARE THESE YOUR PROBLEMS?

HIGHWAY & STREET MAINTENANCE

When prescoring asphalt or concrete you can control the patchwork to regular shapes. You save up to 33⅓% in materials, replacements, and labor.

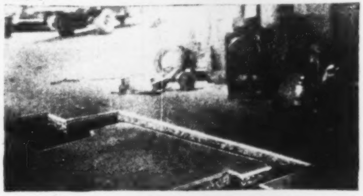


HIGHWAY CONTRACTION JOINTS

In new highway or bridge construction the contraction joints can be cut after the concrete has been set. This saves overtime costs which with other savings amounts to approximately 33⅓%.

SIDEWALK

You can control the asphalt or concrete area in which you must work when trenching for utilities on municipal sidewalks and streets. Here again you can save up to 33⅓%.



INDUSTRIAL PLANT FLOORS

Areas can be controlled for conduit piping and machinery foundations as well as for maintenance and patching. Save as high as 33⅓%.

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Write REGARDING YOUR SPECIFIC PROBLEM

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EDITORIALS

Earthquakes and Schools

An old story was repeated in reports of the recent earthquake in the Northwest—school buildings suffered badly and children were killed or injured by falling parts of the structures. California learned that lesson during the Long Beach earthquake in 1932, paying a high price in lives lost for the resulting strong school-building law. But elsewhere in the country little if anything has been done, in spite of the fact that the long spans so frequently used in school buildings make them particularly subject to earthquake damage. When it is realized that earthquake damage is possible in the greater part of this country, and that it might be considerable in many regions, such as most of New England, the almost nation-wide complacency toward possible earthquake damage to schools is reprehensible. If the Northwest earthquake helps to end that complacency some good may come from it.

Hazards in Abandoned Structures

Nothing has stirred public interest and sympathy as much in recent years as the fatal accident to little Kathy Fiscus who fell into an abandoned well in San Marino, Calif., and died before heroic construction crews—toiling without regard for their own safety—could reach her.

This needless tragedy will undoubtedly stimulate a rash of new public safety laws—which will be of little use unless enforced.

But regulations and enforcement are not enough. Management bears a very real obligation to safeguard dangerous structures and operations at all times. Abandoned structures are too often forgotten and left to deteriorate into serious hazards. In-use utilities, as well as industrial processes, are frequently poorly protected. Construction operations—glamorous magnets for inquisitive, irresponsible children—hold a constant threat of tragedy. Project clean-up too frequently is improperly or incompletely carried out. What then is needed? It is this: Industrial and utility executives, construction men and public-works officials must discharge their responsibility—a trust based on humanity and public safety—and see to it that hazards like the abandoned well at San Marino are eliminated.

Economical Pavements

Over two years ago when Norman W. McLeod, consultant to the Canadian Department of Transport, reported at the Highway Research Board meeting that preliminary results of a study of flexible pavements on airfields in Canada indicated that widely used design methods of this side of the border were needlessly conservative, the editors of this journal asked Mr. McLeod to prepare a summary of the Canadian studies for its readers. Unforeseen delays held up the completion of that summary, which begins in this issue, but in the interim, continuation of the Canadian studies and independent studies by the Bureau of Yards and Docks have served to confirm the earlier conclusions.

The significant fact about the Canadian studies are that they are not theoretical deductions from laboratory studies or from newly built pavements. As Mr. McLeod sums up the situation, "airports with relatively thin pavements throughout Canada for a number of years successfully carried wheel loads that are several times their safe capacity, according to some U. S. designs."

Chief among those designs is the method set forth in the "Engineering Manual" of the Corps of Engineers, designs that were developed during the war years when it paid to be conservative in order to be certain that an airfield runway would not fail or break up at a crucial moment. But war days are behind us and we are now in the process of spending millions of dollars on new airfields and new highways that require a vast area of flexible pavement. Such pavements should not be overdesigned. They need not be overdesigned if Congress will authorize the Corps of Engineers and the Public Roads Administration to undertake a joint study of current design methods in the light of war experience.

Why Did It Fail

An unexplained failure is a dead loss to progress. No effort, therefore, should be spared to clear up the mystery that surrounds the collapse of the Bluestone River bridge while it was being erected by the cantilever method. The fact that an experienced steel erection contractor was doing the work only heightens the need to find the cause of failure. The load on the bridge was the minimum possible—a simple guy derrick operated by a hoist drum that was not on the span—yet the top chord of one truss ruptured at the second panel point beyond the pier, and the bottom chord of the other truss buckled in the same panel. If investigation shows that the steel was of good quality and that all expected erection stresses were properly taken care of in these members, more subtle causes will have to be sought. No appreciable wind was reported at the time of the accident, but resonant vibrations from even a light wind might occur in a long cantilever arm.

No possibility is too improbable to warrant consideration in the study of this accident. Somewhere something went wrong with conventional ideas of cantilevered truss erection. This method is too important to the bridge construction practice to let a cloud of suspicion hang over it because of an unexplained failure.

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ENGINEERING NEWS-RECORD

APRIL 28, 1949 VOL. 142 NO. 17

Push atom building plan; power prospect brightens

Survey of U. S. atomic energy plant indicates rising production, smoother operation—Atomic Energy Commission pushes nation's biggest peacetime construction program

By Robert B. Colborn
Business Week Staff

Secrecy has kept most of the construction industry from knowledge of the fact that one of the most remarkable construction jobs in history is now going ahead at the Hanford, Wash., plant of the Atomic Energy Commission.

Costing almost half a billion dollars, and involving virtual duplication of the existing plant at Hanford, this work is only one of many works now under way. The U. S. atomic energy "industry," now straightening away after settlement of nagging political questions, is devoting itself to the more normal management problems of increasing efficiency and production.

A nation-wide survey of the current atomic energy situation—the third in as many years by Business Week (a McGraw-Hill publication)—turns up two points of major interest to the construction industry:

1. The biggest single peacetime construction program in history,

2. Brightening prospects for industrial power from atomic energy or its by-products.

The tremendous construction program at Hanford and at other points has its roots in the combination of political indecision, war weariness, the haste of construction of the original atom production plants that followed immediately on the war. While the politicians vacillated on atomic policy, the production plant and the staff that built and operated it quietly—but rapidly—began to deteriorate. Improvements in processes helped obsolescence advance on existing equipment.

In this process, Hanford's "piles" (where fissionable materials are produced) deteriorated seriously; the chemical plant proved inefficient for long-term operation; a virtually complete new plutonium plant was needed to increase production and to act as a hedge if the war-built plant should go to pieces.

Some of the chemical problems have been solved. The piles are operating at full rate, and the duplication program is going ahead.

Precision work

Unlike big construction jobs of former days, the Hanford job is not primarily a matter of moving lots of earth, pouring lots of concrete. It involves precision work of a sort that would ordinarily be considered a job for the toolmaker—not the construction man. But construction crews have been trained to do it successfully.

For example, one 40-ft. section of the job is crammed with equipment that has to be welded into place, with tolerances in ten-thousandths of an inch. To make it harder, the tolerances are critical both before and after welding. It was necessary to call in metallurgists to develop welding techniques that could do this—but the men who did the actual welding were regular construction crews.

All the welders on the job were put through a series of tests. The best of them were selected for special training, and then assigned to this tricky job. These men were not set up as a separate craft; they drew regular welders' pay.

One way in which this huge construction job can be described, without getting into secret facts, is this: It's somewhat like building a cross between a wartime powder plant, a synthetic rubber plant, and a utility system. In some ways it even resembles the Mt. Palomar telescope job—handling masses computed in tons with laboratory precision.

(*Continued on p. 34*)

PRA reports break in road bid prices

For the first time since 1940, the Public Roads Administration last week reported a decline in bid prices for highway construction. The drop showed up in the public roads quarterly price index for the first three months of 1949.

This announcement closely follows action taken by the House Appropriations Committee to cut federal-aid highway funds $27,509,000 below Budget Bureau estimates. The committee said that "reductions in the cost of materials should result in lower prices for road construction."

In PRA's price tabulation, the cost index for the composite mile of highway—figured on a 1925-30 base—dropped nearly four points below the preceding quarter. The index for the last quarter of 1948 was 165.3; for the first quarter of this year it is 161.4. This decline amounts to nearly 2½ percent.

Even with the decline, the index for the latest quarter is still 3.2 points above the average of 185.2 for 1948. During 1948, the index climbed from 150.5 for the first quarter to 165.3 in the final quarter.

In another of its tabulations—average bid prices for highway projects utilizing federal-aid funds—public roads has made a useful improvement as the result of an ENR suggestion. The revised tables as issued for 1948 showed—for non-rigid pavement—the quantity and price of both aggregate and bituminous material (put in place in the pavement) in addition to the former price per square yard.

As explained by R. E. Royall, chief of the division of research reports, the new columns giving the prices per ton of aggregate and per gallon of asphalt largely eliminate the effect of differences in pavement thickness which restricted the value of data based solely upon the price per square yard. The additional information, he said, should increase the usefulness of the tables greatly, as price comparisons by states or by types of surface can now be made on a ton and gallon basis with no adjustments necessary for varied thicknesses.

NEWS BRIEFS

Highways—Increasing the federal aid to states to $1 billion annually for badly-needed highway programs, is advocated by Burton F. Miller, managing director, Highway Contractors' Division, American Road Builders' Association . . . DeLeuw, Cather & Co., after a study of an expressway system for Milwaukee, Wis., recommend a 35-mile system of 6-lane highways at an estimated cost of $129 million over a 25-year period. . . On June 1 Pennsylvania will add one cent to its 4 cents a gallon gasoline tax to get $20,000,000 a year more for road building. . . Highway funds of Montana will be boosted about $2,300,000 annually by the additional one-cent-a-gallon gasoline tax. . . Washington state's gasoline tax has been raised to a total of 6½ cents a gal. . . Chambers of Commerce in northeast Nebraska are fighting the new maximum truck load limit of 5 tons per axle, claiming that the restriction is so severe that it threatens the economy of the region. . . A $1,793,973 contract for grading and drainage on 0.89 miles of the Van Wyck expressway in Queens, N. Y. City, has been awarded to Tully and Di Napoli, Inc.

Bridges—Immediate launching of a $23,280,000 bridge and road construction program designed to ease Duval County's major traffic headaches was virtually assured by action of the Florida State Improvement Commission in Tallahassee, recently. Preliminary work has been started to locate the bridges which will be links in the new highway to run north from Jacksonville.

Water Supply and Sewers—Work is progressing on the Hultman Aqueduct of the Metropolitan District Commission of Boston, Mass. The final rock partition of the 13,000-ft. West Newton-Lake St. section was blasted through recently. . . A $1,200,000 sewage disposal system north of Seattle, Wash., is to be built by the Greenwood Ave. Sewer District which is receiving bids for 8 contracts. . . Newberry Electric Co. has a $1,141,672 contract for a power system at the Hyperion sewage treatment plant at Los Angeles. The primary power source will be gas created in sludge digestion. . . According to a report submitted to the N. Y. State legislature by a special committee, the state needs to spend $336,323,000 on municipal sewage plants.

Schools—A $2,500,000 bond issue for a student union building at Washington State College, Pullman, has been authorized by the college regents . . . The University of Idaho regents will consider bids May 24 at Moscow for a $1,000,000 agriculture science building, the first of five buildings in a $3,500,000 program . . . Two 4-dormitory quadrangles are scheduled to be built this summer at the University of Virginia . . . Lumberton, N. C., voters have approved a $3,000,000 bond issue for an expanded school building program . . . Construction is expected to start soon on the first unit of a $4,000,000 engineering and industries building at the University of Florida.

FIRST COLUMN for UN secretariat building (ENR April 21, p. 13). (Wide World Photo)

ASCE board scores Army change

Planned legislation for reorganization of the U. S. Army with particular regard to its technical branches came in for unanimous criticism by the Board of Directors of the American Society of Civil Engineers last week. The board met in Oklahoma City preceding the spring convention of the society held there.

This projected Army reorganization proposal, the board emphasized, should not be confused with any possible legislation resulting from recommendations by the Hoover Commission. It is purely an Army reorganization matter. As to the reports of the Hoover Commission as they affect national resources and the work of the engineering profession, the board decided for the present that the Society as such should take no position either for or against the recommendations for reorganization of the executive branch of the government.

Under the Army's planned change, not as yet printed as a congressional bill, the President of the United States would be authorized to abolish the existing Army technical services such as the Corps of Engineers, Signal Corps, Quartermaster Corps, Transportation Corps and Ordnance Department or to combine any or all of the present duties of these branches with other general branches of the Army such as Infantry, Field Artillery, etc.

The board directed its committee on military affairs and the ASCE representatives on Engineers Joint Council to adopt all available means to assure, by statute, the retention and further development of the professional and technical branches of the Army.

The problem of redistricting and reapportionment of directors as provided by the ASCE constitution again received the active attention of the board. Action in the matter had been held in abeyance pending possible organizational changes in the structure of the society. Studies in this direction will continue, but the board decided to go ahead with redistricting and reapportionment of directors in accordance with present provisions of the constitution at the earliest practicable date.

A proposal for radical changes in technical publications procedures, as submitted by a special committee was an item of major interest and discussion. This involves the possibility of publishing "Proceedings" papers as "Separates" instead of in volumes of "Proceedings" as at present. The plan envisaged by the committee would permit the publishing of upwards of 100 papers per year, instead of approximately 35 as at present and at no greater net cost to the society. The success of the proposed plan depends entirely upon the extent of cooperation which the committee on publications might receive from the several technical divisions in selection and editing of papers in their respective fields. The possibilities of such cooperation will be canvassed.

The board accepted with regret the resignations of two of its members, Edmund A. Prentis, of Spencer, White & Prentis, New York City and Lewis M. Gram, University of Michigan, each of whom resigned because of ill health. Kirby Smith, vice-president, Raymond Concrete Pile Co., New York City and Gordon H. Butler, Corps of Engineers, Duluth, Minn., were appointed by the Board to fill out the unexpired terms.

ASCE told of bright industry future, hears Southwest engineering problems

Annual spring meeting at Oklahoma City reflects optimism on return of stable conditions—Speakers detail oil industry problems

"It's time to quit worrying about the future."

Although Warren S. Bellows, contractor of Houston, Tex. did not get an opportunity to offer this advice until the second day of the convention, it reflected the general sentiment that pervaded the Spring meeting of the American Society of Civil Engineers in Oklahoma City last week.

A program centering on the public improvements of the convention city and the engineering and construction aspects of the nation's southwestern oil empire was presented to some 300 members of the society. Interspersed with the regional papers were others focusing on a broad list of technical problems that confront the profession.

The Oklahoma section, which had never before played host to the ASCE, leavened the convention sessions with numerous social events and excursions to engineering points of interest. Whether by coincidence or planning, the annual "89er" Parade, commemorating the opening of Oklahoma Territory to land settlement, took place on the second afternoon of the meeting. This flash-back to the pioneer days of 60 years ago emphasized anew the phenomenal growth that has occurred in this area of the country. All sessions were delayed until the cowboys, bands and buckboards had passed.

General chairman of the ASCE convention, the first ever held in Oklahoma, was David B. Benham of the Benham Engineering Co. Others prominent in the planning and guidance of the meeting were Prof. J. Ray Matlock of the University of Oklahoma, president of the Oklahoma Section of the ASCE and Webster L. Benham, national director of the society from the district.

Speaking to a construction industry luncheon, Mr. Bellows, quoted above, went on to say that "We have worried so long about what lies ahead that it is now time to move forward with more assurance. Costs are stabilizing. Materials are more plentiful. Labor is available. And contract competition is here." This last point Mr. Bellows vouched for from personal experience. Corridor conversation at the convention was universally optimistic on the return of normal stable construction activity, particularly in public works.

The current contribution of Oklahoma City to public works activity centers on new sewage disposal facilities, with large main sewers already completed and one of two new treatment plants under construction. Webster L. Benham, consulting engineer for the project described the new Southside plant in a paper before the sanitary engineering division.

Oklahoma City's problem is to secure an effluent containing nitrites and nitrates, so that it can be discharged into the virtually dry bed of the North Canadian River. The proposed Northside plant, for which money is not yet available, will be of the activated sludge type since only domestic sewage will be handled. At the Southside plant, however, there will be a heavy concentration of packing house wastes. Hence two-stage trickling filters will be used—high-rate biofiltration to remove as much B.O.D. as possible, followed by low-rate to assure the necessary nitrates and nitrites. The Southwest plant is designed for 25 mgd. and a contributory population of 460,000. The trickling filters will be among the largest ever built—166 ft. dia. for the 4 primaries and 186 ft. for the 8 secondaries.

Railroads and city planning

Oklahoma City also provided an example of how rearrangement of railroad facilities can aid city planning. Through a long-range program that began in 1928 the Rock Island station and tracks were removed from the central business district providing a site for a civic center that now contains the court house, municipal building and auditorium. S. Herbert Hare, planning consultant of Kansas City, who handled the project, pointed out that property values in the vicinity had been greatly increased and that sites facing the landscaped plot had been made available for large commercial buildings.

Harland Bartholomew, planning consultant of St. Louis, cited numerous other cities that have benefited from railroad terminal relocation, track rerouting or grade eliminations. Some orderly and long-range plan is necessary for nearly every city in the country, he said. Also rearrangement of inefficient rail facilities should usually be accompanied by coordination with bus terminal locations and road transport requirements generally. R. E. Dougherty of the New York Central System agreed with the desirability of rail improvements in cities, but emphasized the huge costs involved and the need for realism and fairness in fixing the railroad's share. He cited a city that had contributed only $170,000 to a multi-million dollar grade elevation, and now was receiving that much each year in new taxes resulting from the improvement that the railroad had financed.

Oil production problems

Disposal of oil field wastes and the building of drilling platforms in the Gulf of Mexico are top-priority problems of a civil engineering nature confronting the petroleum industry. E. W. Hamburg, pollution superintendent of the Oklahoma division of water resources reported that the danger to domestic surface water supplies has been greatly lessed by the practice of injecting oil field brine back into the ground through wells reaching to salt bearing formations. Some 200,000 bbl. of brine daily are thus disposed of in Oklahoma. No type of evaporation is satisfactory for disposing of these dangerous wastes, said Mr. Hamburg.

Great progress has been made in constructing safe oil well drilling platforms for the field underlying the Gulf of Mexico, according to M. P. Anderson, chief engineer of Brown & Root, contractors of Houston, Tex. Failures occur only when the platforms are overtopped by waves or when the turnbuckle details on the cables that form the cross bracing in the pile supporting structure gives way. Platforms are now built with 27 ft. water clearance and carefully designed cable details, and none of these has failed even in severe hurricanes.

Construction problems, too, have been conquered, with pile driving boats so anchored that extreme accuracy and continuous driving is assured. Steel pipe piles over 100 ft. long and 30 in. dia. are driven. Towers 60 ft. high surmounted by 60 ft. of open top leads are used, an arrangement that cuts down the dangerous overturning moment from wind that would be encountered with full-height conventional leads.

Dams and reservoirs

Impounding of water for flood control, power and domestic supply is underway on a large scale in Oklahoma. Col. C. H. Chorpening, engineer of the Tulsa Army Engineering district, reported that four dams had been completed, beginning with Denison before the war, and that six are underway. The largest is the $46 million Ft. Gibson dam on the Grand River. Here, in accordance with Corps of Engineer requirements, Johnson-Winston-Kiewit, the contractors, are using sand manufactured from the local limestone and are using ice to keep concrete placing temperatures between 50 and 60 deg. Ft. Gibson Dam along with Pensacola Dam already in service and Markams Ferry Dam yet to be built, will so control the Grand River, that its flood damage potential will be reduced 80 percent.

In the course of his talk on Corps of Engineers activities, Colonel Chorpening noted the Hoover Commission report's statement that only 200 officers receive training from Corps of Engineers civil works activities. He said the fact is that the entire complement of 1,700 officers receive such training. In addition, many of the civilian personnel of the Corps are rendered capable of becoming officers in any emergency, as many hundreds of them did in the last war.

Measuring sediment deposits in reservoirs by supersonic methods was described in papers by C. W. Thomas of the Bureau of Reclamation and J. M. Caldwell of the Corps of Engineers. Echo recorders for depth measurement have become reliable pieces of equipment. Even contractors are starting to accept echo soundings as the basis for excavation payments. When using supersonic echo apparatus, two possible sources of error must be eliminated: (1) The "sound cone" covers a relatively large area in which the echo comes back from the highest point; lead line sounding may be necessary as a check on the nature of some bottoms. (2) Where soft mud is excavated the echo may come back from harder material underneath. This possibility too, should be investigated.

Rational structural design

New light was thrown on structural design theories affecting both concrete and steel by papers delivered before the structural division. Robert F. Blanks, chief, research and geology section, Bureau of Reclamation, reported results of tests on concrete plates pierced by holes, which increase existing knowledge of plastic action. Although cracks appeared in the pierced plates at much lower loads than for solid plates, failure occurred at about the same loads for both types of plates. The stress concentrations around the holes were eliminated before the failing loads were reached as a result of plastic action.

The immediately practical application suggested by this finding is to reduce or eliminate the requirement for reinforcing steel conventionally used around openings in concrete sections. From a broader viewpoint the results are consistent with the so-called theory of ultimate design in which plastic instead of elastic action is the basic criterion. In Mr. Blanks opinion, they lend support to the idea of basing factors of safety on the true conditions at time of failure instead of determining them by extrapolating elastic action up to point of failure.

In the steel field, H. E. Wessman, dean of engineering, University of Washington, and Prof. T. C. Kavanagh, Pennsylvania State College, presented a study of the question of end restraints of compression members in trusses. Their conclusion: Complete trusses, either full scale or model, should be tested because the change in end restraints as the load increases cannot easily be duplicated by loading an isolated column member in a testing machine. A second and equally important conclusion is that the effect of end restraint is negligible for short columns, i.e. those with an l/r of less than 100. This statement applies, however, to steel trusses only. For aluminum trusses, the actual degree of end restraint will be quite important.

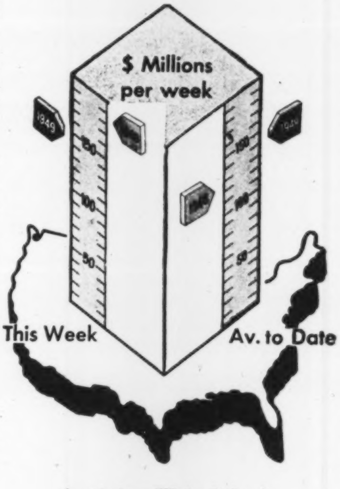
Foundations and surveying

Among other divisions holding sessions at the meeting were those of soil mechanics, surveying and mapping, and highways. Professors Parcher, Hall and Means of Oklahoma A & M College told of the difficulties of building on the Permian clays of central Oklahoma. These red clays shrink and swell with changes in water content to such an extend that many structures have been seriously damaged. Avoidance of trouble is only possible by carrying foundations deep enough to penetrate the water table, by using independent column footings heavily loaded (5,000 psf. or more) and by supporting walls on grade beams that are a part of the structural frame.

The surveying and mapping division heard about an instrument that determines a profile merely by driving a vehicle in which it is mounted over the area. Known as the Stanolind elevation meter it was described by Daniel Silverman of the Stanolind Oil & Gas Co., Tulsa. The apparatus operates on the slope integration principle. The slope is obtained from the angle between the normal to the vehicle bed and the true vertical as determined by a pendulum. Distance is obtained from the vehicle wheels. The accuracy of the results is said to equal that of alidade surveying.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	May '49	472.10	226.94
Building Cost	May '49	348.92	188.62
Volume	Apl.'49	268	118



Activity This Week

As reported to ENR
(in millions of dollars)

Amount of Contracts let

	Week of Apl. 28 1949	Cumulative 1949 (17 wks.)	Cumulative 1948 (18 wks.)	Cumulative % chge av.wk.
Federal	$15.4	$362.7	$404.4	−5
State & Mun.	71.5	877.7	750.9	+24
Total Public	$86.9	$1,240.4	$1,155.3	+14
Total Private	59.1	1,221.8	1,046.5	+24
U. S. Total..	$146.0	$2,462.2	$2,201.8	+18

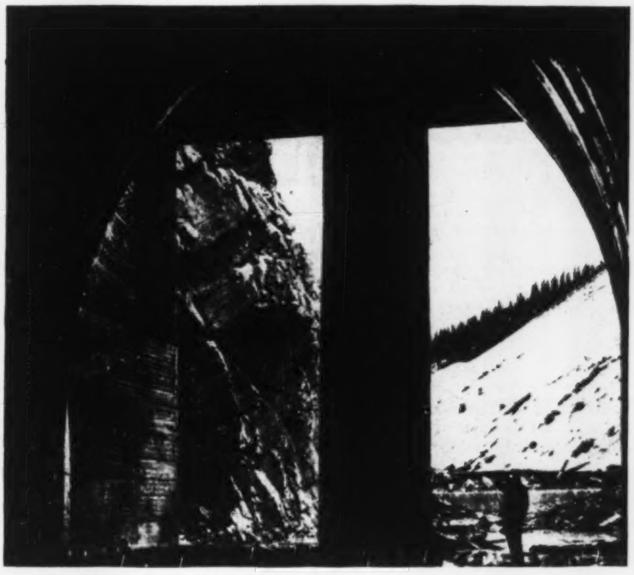
Contracts by type of work

	This Week	Cumulative 1949 (17 wks.)	Cumulative 1948 (18 wks.)	Cumulative % chge av.wk.
Waterworks.	$8.6	$51.9	$56.5	−3
Sewerage ..	4.5	73.5	74.9	+4
Bridges	3.1	109.3	96.0	+20
Highways ..	21.9	189.7	285.1	−30
Earthwork, Waterways.	23.6	203.1	211.2	+2
Buildings, Public	19.6	531.4	354.9	+59
Industrial .	11.9	339.6	326.4	+5
Commercial	43.2	775.4	635.2	+30
Unclassified .	9.6	188.1	161.8	+23

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (17 wks.)	Cumulative 1948 (18 wks.)	Cumulative % chge av.wk.
NON-FEDERAL ..	$1,658.9	$1,224.4	+43
Corporate Securities	844.4	703.5	+27
State and Municipal	814.5	520.9	+66
Total Capital	$1,658.9	$1,224.4	+43



INSIDE LOOKING OUT—Probably this was the last photograph to be taken from within the 36-ft. diameter Hungry Horse Dam diversion tunnel before water first flowed through it recently.

Hungry Horse diversion accomplished

In advance of the permanent diversion scheduled for later this spring, the south fork of the Flathead River recently was turned temporarily through the 1,180-ft. bypass tunnel at Hungry Horse Dam in northwestern Montana.

The temporary diversion, accomplished by a rock and earthfill dike constructed across the river, permits construction crews to fill in the center section of the upstream cofferdam. Wing sections of the cofferdam have been completed to a height of 30 ft., and the center section will be brought up to a height of 20 ft. above the river bed before the spring runoff, expected in May or June.

During the flood, the river will pass partly through the diversion tunnel and partly over the cofferdam and down the river channel.

Permanent diversion will take place after the spring flood. As soon as possible after the peak passes, the upper cofferdam will be raised to a height of 60 to 100 ft., depending on river flow conditions, to shunt the entire flow through the 36-ft. diameter diversion tunnel. A second cofferdam will be constructed some 1,100 ft. downstream and the section between the two dams pumped dry.

Excavation crews of the General-Shoa-Morrison Co., prime contractor for the $43,000,000 dam and powerhouse job, then will excavate to solid bedrock. First concrete for the 520-ft. high dam will be placed late this summer.

Under the present construction schedule, the diversion tunnel will carry the entire flow of the river until the fall of 1951. At that time heavy steel gates will be dropped into place to block the upstream entrance, and storage of water behind the Bureau of Reclamation dam will be started. By the spring of 1952, 1,000,000 acre-ft. of water will be stored behind the dam—scheduled to be some 400 ft. high at that time.

Finally the diversion tunnel will be sealed permanently with a concrete plug 360 ft. long near the upper end. About 170 ft. of lower end of the diversion tunnel will be concrete lined.

◆

Recommend two tunnels under Lachine Canal

Two vehicular tunnels under Lachine Canal in Montreal, to cost $10,000,000, are recommended by Transport Minister Chevrier, following a conference in Ottawa with Public Works Minister Fournier and a delegation from Montreal.

The Lachine Canal, linking the harbor of Montreal with the St. Lawrence above the Lachine Rapids, runs through the heart of the industrial section of the city. It is crossed by several bridges and by one vehicular subway. Since the canal is owned by it, the federal government assumes responsibility for part of the cost of canal crossings. The plan now being proposed by Minister Chevrier would make the dominion government responsible for two-thirds of the construction costs and Montreal for the remaining third.

Pact ends opposition to big Connecticut dam

Organized opposition to construction of a large dam on the West Branch of the Farmington River in Connecticut came to an end April 18. The Hartford Metropolitan District and Allied Connecticut Towns, Inc., agreed then to a settlement to permit construction of the Hogback Dam after approval by the Connecticut Legislature.

Agreement is in the form of a pact, under which the Metropolitan District will not build a dam below the Hogback site to and including Satan's Kingdom. Boating and fishing will be allowed on the Hogback Reservoir and the watershed will be open to hunting and fishing. A commission of seven members will regulate the recreational features. It will include men from the State Health Department, State Board of Fisheries and Game, Water Bureau of the Metropolitan District, and from the towns of Colebrook, Barkhamsted and New Hartford.

It is agreed waterflow from the Hogback Dam will be maintained at 50 cu. ft. per second as against the original-bill specification of 25 cu. ft. Within 15 years the district would rebuild the Greenswoods Pond Dam, built 91 years ago, and which was washed out in 1936. This is to be done for recreational purposes. It may also be used for power, but not for water supply.

The district will consider flood control possibilities at Hogback by increasing the height of the dam. It has agreed to sell to approved purchasers land in the east and west areas outside the watersheds. An amendment to the Hogback bill will make terms of the pact obligatory. Colebrook, Barkhamsted and New Hartford will hold town meetings at once, and a legislative hearing about the bill is scheduled.

Atom plans pose engineering challenge

(*Continued from p. 29*)

The greater part of the construction—a part that may reach $350 million worth—is being handled under contract with General Electric by a joint contracting firm, Guy F. Atkinson Co. and J. A. Jones Construction Co.

The sub-contracts placed by the general contractor give another clue to the type of work involved. Some 35 to 40 percent of the entire job is included in a plumbing, heating and ventilating subcontract placed with Urban, Smythe and Warren. Another 15 to 20 percent is accounted for by an electrical subcontract held by the Newberry Neon Electric Co.

Morrison-Knudsen of Boise, Idaho, has a separate contract with G.E., running into tens of millions, for rehabilitation of the railway line into Hanford and for construction of additional waste storage tanks.

Hanford isn't all the construction, by far.

Other work planned includes: A $70,000,000 gaseous-diffusion plant at Oak Ridge; a huge new reactor and materials tester in Idaho; and almost complete rehabilitation of the atomtown of Los Alamos (this last being an important morale measure).

Power prospects

With its weapons-production problems now substantially smoothed away, AEC is finally turning attention to the problems of power development.

A year ago, the bright postwar hopes for industrial power from atomic fission were receding farther into the background every day—submerged under AEC's intense concentration on immediate military needs.

Now the hopes are coming back. AEC has decided to build several different types of atomic engine. Today, these are still on the drafting boards and in the laboratories, but by the end of this year two of them will be under construction.

By about 1953, the atom engineers expect to have the answers to most of the key questions on power. If all goes well, they will have demonstrated that useful power can be produced by splitting uranium. They will know if they can count on a plentiful supply of atomic fuel. They should have the figures from which some reasonable estimates of eventual power costs can be calculated.

Sometime after 1953 one of these atomic engines should go into operation—a plant on a commercial scale and possibly with commercial costs. At that point, the atom will be in business.

Meanwhile, at Schenectady, N. Y., General Electric is nearly ready to start construction of a pilot version of an atomic central-station power plant. This plant, it is hoped, will combine breeding (a recharging process to replace U-235 atoms drained off in the piles) with the generation of substantial amount of power.

Uncertainty in picture

One of the most maddening things in the whole atomic energy picture, of course, is the element of pure luck involved—an element that might knock out any of the props, by the discovery of some newer, easier, cheaper way of producing fissionable material.

The atom scientists admit that in the present wabbly state of physical theory, almost anything can be true. The science of sub-atomic physics swarms with particles and forces that have no satisfactory relation to each other—each invented to explain some particular sets of facts.

That's why AEC feels it necessary to sink a lot of effort and money into theoretical research that has no very immediate connection to uranium fission. It's why, for instance, AEC is furnishing $9,000,000 to the Berkeley Radiation Laboratory to build a 6 billion volt cyclotron. So far as anyone knows, the machine has nothing very much to do with atom bombs. But if we didn't build one somebody else might—and they might just possibly make a discovery leading to a new weapon.

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U. S. agencies deny ill effects from DDT

Seeking to ease public concern over the possible effect on human beings of use of DDT for insect control, two government agencies last week denied that any ill effects had been traced to the substance.

In a joint statement, the Federal Security Agency and the Department of Agriculture declared that there is "no evidence" that the use of DDT in accordance with the recommendations of various federal agencies, has "ever caused human sickness due to the DDT itself." The agencies added that minor toxic symptons that may be noted are a possible result of kerosene and various solvents used in DDT—and in practically all other insecticides.

"Statements that DDT is responsible for causing the so-called 'virus X disease' of man and the 'X disease' of cattle are totally without foundation. Both of these diseases were recognized before the utilization of DDT as an insecticide," the statement said.

◆

Major gas pipeline construction planned

Three gas pipeline projects aggregating 1,027 miles and costing more than $100 million, were announced last week.

Biggest project was planned by the Texas Gas Transmission Co., of Owensboro, Ky., which received final approval from the Federal Power Commission to build and operate a 26-in. natural gas line extending from fields in Texas and Louisiana to a connection with the "Big Inch" line near Middletown, Ohio. The $73,000,000 project will include 800 miles of pipe.

The Texas Eastern Transmission Corp. announced a new expansion program to cover putting down of 177 miles of 26-in. pipe from the company's Station No. 16 at Lebanon, Ohio to Summerfield, Ohio. The project will cost over $24,000,000.

At Indianapolis, Ind., the Citizens Gas and Coke Utility announced it planned to build a $2,400,000, 55-mile line to connect with the Texas Eastern lines in southern Indiana.

◆

Va. communities plan joint pollution fight

The Northern Virginia Regional Planning Commission last week approved proposed joint action by four Virginia communities to abate pollution in the Potomac river.

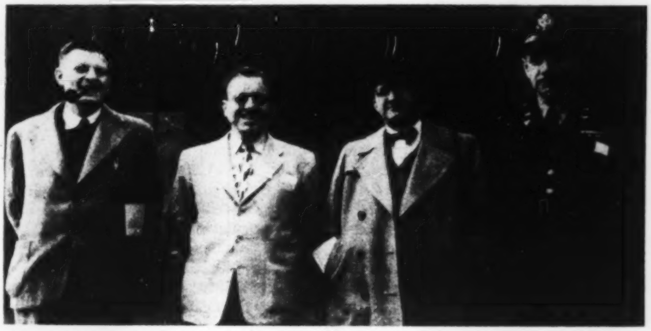
The commission approved a report from its water supply and sanitation committee which recommended the joint program. Earlier the group had offered its services as an agency to investigate costs of a survey and pave the way for the regional sewage program.

The cities involved are Alexandria and Falls Church; counties filling out the commission's five parts include Arlington, Fairfax and Prince William counties.

The group proposes a joint treatment plant to take care of their sewage.

MEN AND JOBS

M. V. Pregnoff, San Francisco structural engineer, makes a point during a symposium on lightweight concrete at the recent convention of the Structural Engineers Association of California. Looking on are S. S. Stahl, of Osborne Laboratories, Los Angeles, and Paul F. Jeffers, structural engineer, Los Angeles.



John J. Baffa, consulting engineer, New York City; Leslie E. West, chief engineer, Joint Meeting Sewage Treatment Plant, Elizabeth, N. J., J. J. Gilbert, sanitary engineer, Link Belt Co., Philadelphia; and Lt. Col. F. H. Whitely, Medical Service Corps, U. S. Army, New York City, pose at Detroit's sewage-treatment plant during the recent Federation of Sewage Works Associations inspection trip.

Harrison Hawkins has left as asphalt engineer with the Wasatch Oil Co. at Spokane, Wash., to become Clallam County engineer at Port Angeles, Wash. He was with the Washington State Highway Department from 1927 to 1942, when he became Adams County engineer at Ritzville, Wash., later taking a similar position at Okanogan and joining the Spokane firm in 1946. Hawkins succeeds **Theodore F. Rixon**, who had held the position on a temporary basis since January, when **Herman Ahlvers** resigned to become Port Angeles city engineer.

Appointment of **William F. Duncan**, of Swissvale, Pa., as junior sanitary engineer for the Pennsylvania State Department of Health has been announced. **Samuel Z. Studenroth**, of Talmage, Pa., has withdrawn as sanitary engineer.

A. H. Bohlen, graduate civil engineer from The Citadel, has been named by the Orangeburg, S. C., County Highway Commission to administer the county's business.

Frank J. Kish, after completing work on a 60,000 kw. steam plant at Sparrows Point, Md., has been transferred by the United Engineers & Constructors to Wilder, Vt., to be job engineer at Wilder Dam.

(*Continued on page* 86)

Big pipe line work proposed in Canada

A program of gas and oil pipe line construction in Canada, costing $250,000,000 was foretold to the Canadian Senate in Ottawa on March 28 by Transport Minister Chevrier, who listed the following five projects as under consideration.

Interprovincial Pipe Lines Ltd., sponsored by Imperial Oil Ltd., will be capitalized at $200,000,000 and proposes to build a pipe line from Edmonton to Regina at a cost of about $40,000,000, as the first stage of its development which eventually may include lines to the international boundary.

Oueont Pipe Line Co. a subsidiary of three of the other larger Canadian oil companies, proposes to build an interprovincial pipe line at a cost of possibly $20,000,000.

Western Pipe Lines will reintroduce its request for incorporation with the prospect of building a natural gas pipe line from Calgary, Alta. to Winnipeg, Man., at an estimated cost of $48,000,000.

Alberta Natural Gas Co. proposes to build a gas pipe line from Alberta across the mountains to Seattle, Wash., and Vancouver, B. C., at a cost of approximately $100,000,000.

West Coast Transmission Co. proposes to build another natural gas pipe line from Alberta to British Columbia and Washington, with an estimated cost of between $50,000,000 and $100,000,000.

Minister Chevrier said that all these companies have submitted petitions to Parliament for incorporation.

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Alaska contracts awarded total over $8 million

Five contracts have been awarded by the Corps of Engineers totaling more than $8,000,000 for work at airfields near Anchorage and Fairbanks, Alaska. Also, the Alaska Railroad received a low bid of $4,900,000 for rehabilitation of 144 mi. of line and called for bids on another $2,800,000 project.

Largest of the five awards went to the B & M Construction Co. of Oklahoma City for outside utilities at the Ladd Air Force base. The combination of William A. Smith & Co., Kansas City, and Brown & Root, Houston, Texas, was low for the railroad work. Bids for the new railroad project, involving 12 mi. of railway and highway along Turnagain Arm south of Anchorage, are scheduled for opening May 11.

Strikes ease as unions eye Congress and economics of construction industry

Massachusetts building trades freeze highway, heavy construction wages—Scattered strikes reported, though settlements predominate

With labor leaders apparently marking time while Congress decides on a final version of a new law, the labor pot simmered slowly last week, boiling up at only widely-scattered points.

There was ample evidence that labor was also keeping a wary eye on the economics of construction, and was willing to make some concessions to the need for holding down prices to insure greater volume of business and employment.

Highlight event was the announcement at Boston of a one year agreement freezing wages on heavy construction and highway work in Massachusetts. Somewhat similar to agreements already in existence in New York City, the Massachusetts pact pegs wages for laborers in Greater Boston at $1.55 per hour, and freezes wages in other parts of the state at present levels (ranging from $1.15 upward). Representatives of signatories—the International Hod Carriers, Building and Common Laborers Union (AFL) and the New England Road Builders Association—hailed the agreement as a hedge against rising costs.

At Paducah, Ky., a local of the same international union ended a ten-day strike that had tied up numerous projects in the area, pending negotiation of a new agreement.

Also at Paducah, labor and management agreed on the appointment of R. G. Matheson, dean of Paducah Junior College, as chairman of the city's newly-formed labor-management-public committee (a 12-member group) which has the specific function of settling disputes with public employees.

At Cleveland, the AFL district Carpenters' council took the unusual step of agreeing to forego 1949 wage increases—if other building trades groups will go along. Construction industry representatives—now engaged in negotiating new contracts with some 30,000 building craftsmen in the area—saw the move as a stimulant to greater construction activity.

Other evidence of the "go-slow" trend included:

At Milwaukee, some 20,000 building trades workers were working without contracts, pending negotiations with employers; East Liverpool, Ohio, workmen have virtually agreed to hold the line, under a series of new contracts that continue previous wage scales.

Strikes settled

A number of widely-scattered strikes or threats of strikes were reported settled—many for nominal pay increases. These included: Carpenters in Lincoln, Neb., received a 10 cents an hour increase, to reach $1.92½; hod carriers at Yakima, Wash., accepted a 17-cent hourly increase, to $1.62; heavy construction workers in Eastern Washington and Idaho were granted increases of 5 to 15 cents an hour; sheet-metal workers in the area of Binghamton, N. Y., accepted a 20-cent an hour raise; carpenters in Summit and Medina Counties, Ohio, accepted a 12½ cent hourly increase.

On the debit side, a few strikes were reported during the week.

At Chattanooga, Tenn., AFL iron workers halted work when contract negotiations broke down after about a month of discussion; a work stoppage continued to halt many projects around Harrisburg, Pa., as negotiators of employers and six trades unions failed to reach agreement on new wage scales; and at Louisville, Ky., some 200 workers engaged in building a new feed mill halted work in what appeared to be a sympathy move with truckers who had asked more pay.

NLRB widens scope

The National Labor Relations Board entered the construction labor picture too during the week, with a ruling further outlining the area in which its jurisdiction operates.

The board decided that it could act on what it called an illegal secondary boycott against an electrical contractor who had been doing a $325 wiring job on a $15,200 dwelling, when it ordered Local 501 of the AFL electrical union at Mount Vernon, N. Y., to end picketing aimed at forcing the general contractor to cease doing business with the electrician.

By its action, the board hurdled its previous rulings that it would not take jurisdiction where the effect of the act was so remote as regards interstate commerce as to make it a local affair.

Hawaii pier restored; destroyed in 1946 'quake

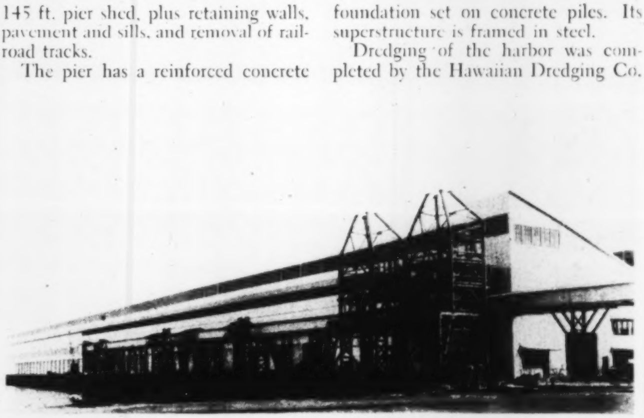
Reconstruction of a $1,600,000 pier shed at Hilo Harbor, Hawaii, has recently been completed with the aid of Federal Works Agency funds. This pier, and another nearby, were damaged by the violent seismic waves of April 1, 1946.

Rehabilitation of the harbor installation was one of several rebuilding jobs caused by a disaster which cost 200 lives and $25,000,000 in property. The 79th Congress appropriated $11,300,000 for rehabilitation work, including that of highways and bridges damaged during the war as well as during the 1946 earthquake.

Major portions of the harbor work was begun in August, 1947, by E. E. Black, Ltd., of Honolulu. The project included rebuilding the 1,040 ft. by 145 ft. pier shed, plus retaining walls, pavement and sills, and removal of railroad tracks.

The pier has a reinforced concrete foundation set on concrete piles. Its superstructure is framed in steel.

Dredging of the harbor was completed by the Hawaiian Dredging Co.



RECONSTRUCTED PIER SHED at Hilo Harbor, Hawaii.

CALIFORNIA HIGHWAY BRIDGE—Longest bridge now under construction for the California Highway Department is one across the Santa Ana River, near Anaheim. Concrete piers for the 1,000-ft. structure are completed and preparations are well under way for casting the reinforced concrete beams and deck slabs. The Chas. MacClosky Co. is the contractor.

States start work on highway programs

Highway spending promised to take the expected lion's share of construction money, as several states announced fiscal year programs last week.

With legislatures enacting proposed road-building budgets (ENR Feb. 10, p. 11) and the construction season already started in most states, highway commissions prepared to go to work on long-range programs, long since developed.

Virginia's state highway commission outlined a $50,500,000 construction and maintenance program for the fiscal year beginning July 1. A breakdown of the total allots $22,000,000 to construction on the state's 9,000-mile primary system, $21,000,000 for construction and maintenance of the farm-to-market routes and $7,500,000 to maintenance of the primary roads.

These allocations jibe with a six-year, $114 million program for rural road construction.

Emphasis on the farm-to-market roads is also apparent in Texas, where Governor Beauford Jester last week signed a bill allocating $15,000,000 for the year. Construction is due to start in September on those unimproved routes essential for milk and mail deliveries and school bus traffic. These will be given an asphalt surface and a full two-lane width.

Arizona highway officials have estimated the state's long-range needs at $55,000,000. Legislators must now reconcile this figure with the $9,000,000 which the state highway department actually has available. Legislators have asked for a survey that will point out the most sorely needed projects and establish a system of priorities.

The state highway commission in Arkansas has programmed $25,000,000 for road construction this year and next. Main line highways in Pulaski County were cited as those most in need of immediate attention.

A near record 1,002 miles of road construction is scheduled by the Oklahoma state highway department in 1949 at an estimated cost of $25,760,000. This figure does not include maintenance, nor does it include farm-to-market road construction.

Long-range Iowa program

The Iowa legislature has set up a new $995,000,000, 20-year road construction and improvement program. Nearly all suggestions by an interim legislative committee have been put into fourteen bills comprising this long range road scheme. One bill channels all road use taxes (motor vehicle licenses and gasoline taxes) into a single fund and provides for this fund's distribution. Under the bill, 42 percent of the money will go to primary roads; 35 percent to secondary roads; 15 percent to farm-to-market roads; and 8 percent to city streets.

Freeway construction is receiving considerable attention in Oregon. The state senate rejected, 24 to 6, a measure which would have prevented spending of highway funds inside cities until all state highways are brought up to federal standards. The bill was ordered back to the Roads and Highway Committee, where sponsors of the proposal plan to revise it.

Passage of the bill would have meant long delay in construction of Portland's $10,000,000 Sullivan Gulch Freeway, leading east to the Columbia River highway, and Salem's $7,000,000 highway and bridge project.

Reports of other superhighways throughout the country include: start of preliminary surveys for a $10,000,000 road to connect Virginia Beach, Va. with Nags Head at Kitty Hawk, N. C. The federal government has approved a proposal for a scenic highway along the Merrimac River near Lowell, Mass.

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New standards are ready on codes and grandstands

Two new publications of the American Standards Association are of particular interest to planners and builders. They are a new edition of the "American Standard Administrative Requirements for Building Codes", and a new standard for grandstands and tents.

Any city that adopts the revised building code will find itself in a better position to use prefabricated construction under its code requirements, since the new edition makes it mandatory and not discretionary, for a building official to accept new types of construction that meet safety and health requirements, the sponsors believe.

Another important change reduces from ten to five years the experience required to qualify a technically trained man to be a competent building official.

The revised American standard makes it easier to compute wind loads on grandstands, and clarifies the requirements for aisles and exits.

The building code administrative requirements, A 55.1–1948 are available at 55 cents a copy from American Standards Association, 70 E. 45th St., New York 17, N. Y. The American Standard for Grandstands, Tents and other places of outdoor assembly, Z 20.2–1949, is available at 25 cents from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass., or American Standards Association, 70 E. 45th St., New York 17, N. Y.

ENGINEERING SCHOOLS

News of Research

Codification of the plastic theory of structural design is not advisable at present, Prof. J. F. Baker, head of the Department of Engineering, Cambridge University, England, pointed out during a recent visit to the United States. He told a meeting sponsored by the Structural Research Committee of the Welding Research Council that considerable information is now available, both analytical and experimental, but there are still too many gaps to permit indiscriminate applications of the principle of limit-load design. Professor Baker also said that residual stresses due to welding structural steel are not of major importance in reducing the load-carrying capacity of structures, provided local instability is avoided.

A new research fund has been established at Ohio State University, Columbus, for scientific studies of housing. The work will deal with home design, standards of living, construction, and large-scale planning of controlled communities or neighborhoods. Galen F. Oman, professor of housing research at the University's engineering experiment station, says one of the goals will be to achieve a 20 per cent reduction in housing costs through standardization of materials and reduction of parts and man-hours on the site. He said this could be done by improving traditional home building procedure through better use of materials.

California Institute of Technology's hydrodynamics laboratory, which has been concerned primarily with problems of military research, is now turning to basic studies which may affect every type of underwater installation and hydraulic equipment. The laboratory, erected in 1944, has completed its conversion from studies of rockets and torpedoes to fundamental studies of the movement of liquids around solid bodies, applicable to peacetime industry and construction.

The Pasadena laboratory's water tunnels—in which speeds up to 100 ft. per second have been attained—can now be commissioned by manufacturers or government agencies for special work. The laboratory already has done some of this type of work for Grand Coulee Dam, the Los Angeles County Flood Control District, and the Metropolitan Water District of Southern California. Of special interest is research now under way on cavitation, which is also being studied at Northwestern University.

In the high-velocity tunnel a camera taking 20,000 frames per second is used to record data. A ripple tank is used to study wave formation, particularly important in the design of harbor installations. There is also a "polarized light flume" for making visible such flow patterns as result when water rushes around the spillway of a dam.

A photographic analyzer used to study results obtained with the high speed cameras is one of the most ingenious of the lab's installations. With this analyzer, the scientists are able to get data out of their high speed camera records in much the same manner as aerial photographs are now analyzed stereoscopically.

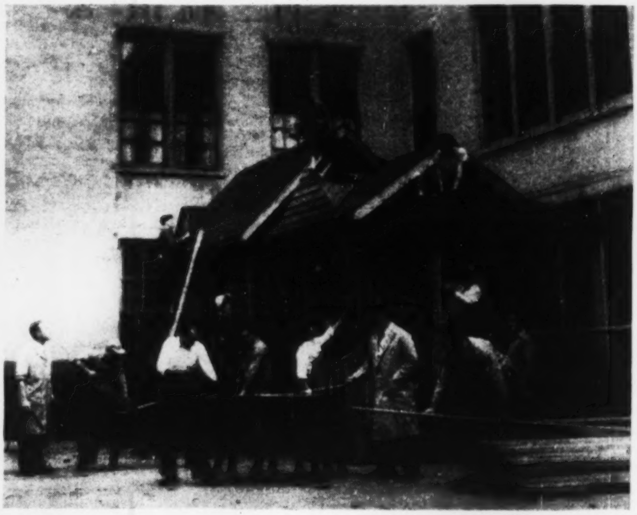
Women Engineers Organize

More than 70 women engineering students representing 19 colleges in the East were the guests of the Drexel Society of Women Engineers at the first conference of women engineering students April 2 and 3. The outcome was the formation of the first Society of Women Engineers, for more than a local group.

Miss Phyllis Evans, a junior in the college of engineering at Drexel, was elected president and Margaret Bliss, Tufts, vice-president; Joyce Killian, Alfred, treasurer; Edna Van Note, Virginia Polytechnic Institute, recording secretary; Consuella Stokes, C.C.N.Y., corresponding secretary; Henrietta Wolf, Newark College of Engineering, editor. Other council members: Nancy Armstrong, Bucknell; Edith Graves, R.P.I.; Lillian Heffernan, Cornell; and Dorothy Johnston, VPI.

Five district groups were formed including 31 colleges enrolling about 200 women engineering students in the area from Massachusetts to Virginia and from the Atlantic Coast to Pittsburgh, Pa., as follows: District I, New England—Northeastern, MIT, Rhode Island, Brown, Rensselaer, Tufts; District II, New York State—University of Buffalo, University of Rochester, Alfred and Cornell; District III, New York City—Pratt, Brooklyn Poly, Columbia, C.C.N.Y., Cooper Union, University of Connecticut, Newark College of Engineering, and NYU; District IV, Philadelphia—Rutgers, Philadelphia Textile, Swarthmore, Drexel, University of Delaware, Penn State, and Bucknell; District V, Washington—University of Maryland, Catholic University, George Washington, VPI, W. Virginia, and Carnegie.

(*Continued on page 90*)



VETERANS BUILD HOUSES—Veterans enrolled at New York's Metropolitan Vocational High School must build and dismantle a house as part of their pre-apprentice course in woodworking and building construction. There are 36 trainees in the course, which is part of the New York Board of Education's special veterans program. The course lasts for 52 weeks. Three houses are built each year. Here, instructor Howard Beebe, holding blueprint, uses a scale frame model to explain building problems to the students. (Wide World Photo)

New York port authority report traffic increase

The six vehicular crossings within greater New York operated by the bi-state Port of New York Authority handled in 1948 the highest traffic volume in their history, the authority reported last week.

Submitting an annual report to the governors of New York and New Jersey, the authority stated that its crossings—including the Holland and Lincoln tunnels and the George Washington Bridge—handled a total of 47,042,000 vehicles, a rise of more than 2,000,000 over 1947.

Reporting on a generally successful year, the authority said it had obtained total gross revenues of $31,930,000 in 1948, from its crossings, airport operations, pier and terminal facilities and the like. The gross figure compares with $28,567,000 for 1947.

About two-thirds of the total revenue was produced by the bridges and tunnels.

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Boston Society meeting begins its second century

The 101st annual meeting of the Boston Society of Civil Engineers, oldest engineering society in the country, was held recently. Business included annual reports of officers and committees and the address of the retiring president, Frederic N. Weaver.

New officers elected are: President, Harrison P. Eddy, Jr., partner, Metcalf & Eddy, consulting engineers; vice-president, Thomas R. Camp, partner, Camp, Dresser & McKee, consulting engineers; vice-president, Prof. John B. Wilbur, head, department of civil and sanitary engineering, Massachusetts Institute of Technology; secretary, Robert W. Moir, senior civil engineer, Metropolitan District Commission; treasurer, Herman G. Dresser, partner, Camp, Dresser and McKee, consulting engineers.

The Desmond FitzGerald Medal Award was given to Thomas R. Camp, partner, Camp, Dresser & McKee; the Clemens Herschel Award to Prof. John B. Babcock, 3rd., professor railway engineering at Massachusetts Institute of Technology; Structural Section Award to Prof. Robert J. Hansen, associate professor, department civil engineering, Massachusetts Institute of Technology; Hydraulics Section Award to George R. Rich, engineer, Chas. T. Main, Inc.; Surveying & Mapping Section Award to Charles M. Anderson, deputy engineer, Massachusetts Land Court.

Pa. truckers, steel men want higher truck weight

Pennsylvania truckers are calling for legislation increasing the allowable weights of commonly-used trucks. About 1,500 truckers from all parts of the state voted at a meeting in Harrisburg "to oppose the election of those who would hamper proper use of the highways of our commonwealth."

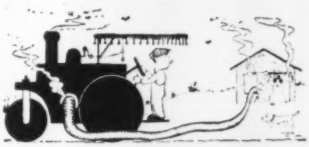
Edward Gogolin, general manager of the Pennsylvania Motor Truck Association told the meeting that "we are seeking a reasonable load on Pennsylvania highways because we put one-third of the dollars into it."

The meeting was called to protest action of the Senate Highways committee in killing a House-passed bill which would permit increase of weight load limits from 45,000 to 60,000 lb.

On April 14, Ben Moreell, president and board chairman of Jones and Laughlin Steel Corp., declared that the state's refusal to increase the maximum legal truck load weights will force curtailment of steel mill operations. He said: "Many of our customers demand delivery by truck. However, there will not be an adequate supply of trucks for our Pennsylvania plants if truckers are limited by law to light, unprofitable loads when they can haul heavier and therefore more profitable loads in surrounding states."

ALSO RECORDED

Smog Remedy?—A San Francisco chemist has the solution for Los Angeles' smog problem — paint the city black. John Finn, consulting chemist, explains that smog hangs over Los Angeles in the morning because most of the sunlight is reflected upward by white buildings, and it warms the upper atmosphere instead of the lower. "This causes a temperature inversion, and the cooler smog will not become heated and rise. If Los Angeles should be painted black, the sunlight would be absorbed and the air above would be cooler, causing the smog to rise and dissipate."



Emergency Heat—In Leominster, Mass., the city's old steam roller, inactive for five years, was recently pressed into service to provide heat for a city block when a boiler went out of commission. Pipe connections were made from the steam roller outside the building to the heating system.

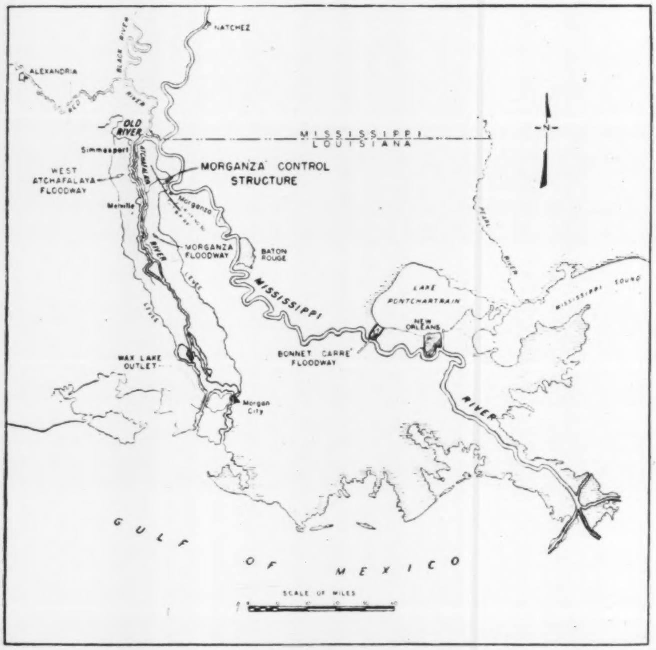
Road to Riches —The Ohio Supreme Court has held that highway contractors are entitled to any minerals they remove in excavating for a road. The court refused to review lower court decisions, which held in favor of Baltes, Inc., a contracting firm which uncovered a seam of coal while building a road in Belmont county. Baltes sold the coal to the Monaco Coal Co. for $11,000. Howard J. Campbell, owner of the land taken for the highway, contended that the coal belonged to him, and sought to recover from the contractor and the coal company.

Earned Increment—A bond issue gave the airport commission at Jefferson, Iowa, just enough money to buy land for an airport. For four years crops were raised on the tract, with a net return of $17,808.33. Now the federal government will match that amount to give the commission about $35,000 for improvement work on the field.

Automatic Fertilizer—"A soil blister" 15 ft. in height, which now covers five acres of land, has been rising on the farm of Henry Huppenthal, in Lake County, near Crown Point, Ind. Geologists believe that it may be caused by an overflowing underground stream. The owner says that overflow "lava" from the mound enriches his surrounding land and that he has raised 110 bushels of corn to the acre on areas adjoining the formation.

Figures Don't Lie — Mathematicians behind the iron curtain, it is said, are being told that they are in error if their figures produce results not in harmony with what their all-wise government thinks they should be. The possible effect of this edict on the design studies of Russian engineers is something to stir the imagination.

Pay Dirt—Bulldozers engaged in rerouting Highway 23 between Darlington and Mineral Point, Wis., are turning out lead-zinc ore on the site of an old mine. Local small fry, armed with buckets, are picking up the stuff after school and on weekends. A bucket holding 85 lb. of ore brings in about $6.50.



MORGANZA CONTROL STRUCTURE is an important element of the lower Mississippi River flood control system.

Army resumes construction work on Morganza Floodway in Louisiana

Work on the Morganza flood control structure on the Mississippi River in Louisiana, suspended in 1942 due to the outbreak of World War II, is expected to be resumed early in May.

The dam, when completed, will provide for diversion of floodwaters from the Mississippi River into Morganza floodway. The $20,500,000 system will be put into operation when the flood flow threatens to exceed safe carrying capacity of the lower river channel. The control structure will also provide crossing over the floodway for Louisiana State Highway No. 30, the Texas and Pacific Railway, and the Louisiana and Arkansas Railway.

In general, Morganza will be similar to the Bonnet Carré Spillway above New Orleans. However, steel gates will be used instead of timber needles, and there will be bridge decks for the crossings.

Earthwork contract let

Recently, bids for constructing a portion of the earth embankment were opened in the office of Col. John R. Hardin, New Orleans district engineer. Grenada Dam Contractors, Inc., of Grenada, Miss., were low bidder with a $1,555,000 proposal.

Under this contract 3,810,000 cu. yd. of earth will be placed in the embankment approaches of the control structure. An additional 1,290,000 cu. yd. will be placed under later contracts.

Completed approaches will have an average height of 32 ft. above the present ground elevation, a crown width of 75 ft. to accommodate the railroad and highway, and a maximum base width of 435 ft. Approaches will extend approximately 9,500 ft. into the floodway from each side levee.

The control structure proper, to be built under a later contract, will be centrally located in the floodway and will have an overall length of 3,906 ft. It will consist of a concrete weir having 125 steel gates, 22 ft. 6 in. high and 28 ft. 3 in. wide, for regulation of flow into the floodway. The steel gates will be raised and lowered by a gantry crane traveling on rails supported by concrete piers. Reinforced concrete bridge decks, spanning the gated bays of the weir, will be provided for the railway and highway crossings at the site.

Pile tests will be started this month by the Corps of Engineers for the foundation of the control structure. Martin G. Chitty, field assistant for the Corps of Engineers at Baton Rouge, will supervise the work.

◆

Iowa enacts flood control, water resources program

Iowa's Governor W. S. Beardsley recently signed a group of eleven bills that form the state's first definite water resources conservation and flood control program.

Key bill in the series is one creating a "State Natural Resources Council." The seven-member council, to be appointed by the governor, will be a part-time advisory board, empowered to appoint a director to do the administrative work.

Some of the council's main duties and responsibilities are to be: Review plans and specifications for all flood control structures and to authorize their construction in state streams; to have the power of eminent domain and to institute condemnation proceedings for the removal of existing obstructions; and to draw up statewide flood control program and a statewide program for conservation.

Among the other measures is a stream pollution control act which gives the state health department additional powers in ordering discontinuation of pollution. This measure also requires health department approval of construction of any new sewage disposal plants or methods.

A sewage treatment plant special assessments bill allows cities and towns to levy special tax assessments to retire bonds floated to finance municipal treatment plants. Such assessments could be levied in addition to present sewage rental ordinances based on water use.

◆

Group urges engineer be appointed to IJC

Appointment of an engineer to the Canadian vacancy on the six-man Canada-U. S. International Joint Commission on waterways has been requested by the Dominion Council of Professional Engineers.

At the council's annual meeting in Vancouver, B. C., it was decided to send a wire to Prime Minister St. Laurent urging the appointment. It was pointed out that two of the three Americans on the commission are engineers, while neither of Canada's two present representatives are.

UP AND OUT—A 750-lb. dynamite blast shoots earth and boulders high in the air to remove the last earth plug in the new Liberty Bend cut-off near Kansas City. The new waterway, eliminating a seven-mile gooseneck curve, shortened the Missouri River by 14 mi. Part of long range Missouri River plans, the cut-off was scooped out by Army Engineers, who hope it will speed sluggish waters of the river past Kansas City. Final cut-off channel (after scouring) is expected to be 1,000 ft. wide and 15 ft. deep.

Canadian groups study professional standards

Two three-man committees have been authorized by the Dominion Council of Professional Engineers of Canada to investigate professional standards. Legislation affecting the practice of engineering has recently been in question in three of Canada's nine provinces (ENR March 31, p. 31).

Committees of the Dominion Council will consider uniform examinations for entering the profession, plus experience requirements. They were set up at the council's recent annual meeting at Vancouver, B. C.

Named to the committee considering experience requirements are Frank Forward, head of the University of British Columbia department of mining and president of the council for the past year; and J. A. H. Henderson, vice-president of the Corporation of Professional Engineers of Quebec. These two will name a third member to the committee.

◆

Milk River funds sure; Canada resumes project

With funds again available, construction work on the St. Mary-Milk River irrigation project in western Canada will soon be in full swing. Over $3,000,000 has been made available to the federal Department of Agriculture for operations during 1949.

Nearly $3,000,000 has already been spent on the scheme, to irrigate of 513,000 additional acres in the Lethbridge district. Total cost of the project will be about $23,000,000.

Most of this year's construction activity will center about St. Mary's Dam. This will be one of the largest earthfill structures yet to be built in Canada. It will be 190 ft. high when completed; at present it has been brought to a height of 75 ft. Its length will be about one-half mile.

One diversion tunnel has been built at the site, and a second large tunnel is to be built this year.

◆

Lumber dealers study lowering housing costs

A Lumber Dealers Research Council has been organized to sponsor and co-ordinate a nationwide research in housing cost reduction.

One of its first actions was to arrange a contract with the Small Homes Council of the University of Illinois to engage in a study and development of modular planning units, using the cost-saving construction methods recently tested by the Producers Council and the National Retail Lumber Dealers Association. This work is to be supplemented by a similar study at Ohio University.

The council will also cooperate with the Research Institute for Economic Housing, Inc., to lower housing costs through the package system of distributing materials and mechanical units to be fully detailed for easy installation into modular planned units as developed under the first project.

The executive committee consists of C. A. Thompson, Champaign, Ill.; Norman Mason, North Chelmsford, Mass.; Paul Cadwell . . . Pennington, N. J.; Lynn Boyd, Pampa, Tex.; Paul De Ville, Canton, Ohio; Ray Schaub, Whiting,; O. J. Allerton and Russell Nowels, Rochester, Minn.; Lisle Peters, Lake Charles, La.; Wm. K. Barr, Denver, Colo.; Jos. Copeland, Portland, Ore.; Arthur A. Hood, Chicago; and J. D. McCarthy, Springfield, Ill.

Chesapeake span tenders split to lure bidders

Working to bring costs of the new Chesapeake Bay Bridge within reasonable sight of engineers' estimates, the Maryland State Roads Commission last week decided to split substructure work into six or seven parts.

When bids were called on the entire substructure some weeks ago (ENR March 31, p. 29) the lone bid was 66 percent above the estimates. The state immediately rejected the tender, and a bill was introduced into the state legislature to permit negotiation of a contract (ENR April 7, p. 5). This bill was later dropped.

Under the new scheme, the substructure work will be subdivided to attract smaller firms into the bidding picture. No contracts will be awarded, however, until all the bids are in—a matter of some weeks—after which the state will add up the low bids and determine if the total is within the funds available for the project. If this proves to be the case, contracts will be let—probably all on the same day.

◆

Conn. Senate OK's bill for Public Works Dept.

A bill has passed the Connecticut state senate which would create a state Public Works Department to be headed by a commissioner with annual salary of $10,000.

The state Public Works Department, previously a permanent fixture in Connecticut, was abolished as an economy measure.

Only amendment to bill, recreating the department as it was, would permit inmates of penal institutions to do work on institution construction projects not exceeding $2,000 in cost.

Economical Flexible Pavement Design Developed from Canadian Runway Study

Norman W. McLeod

Engineering Consultant, Department of Transport, Ottawa, Canada

***Editor's Note*— A study of flexible pavement design methods of major importance to engineers concerned with the design of both highways and airports has been under way on airfields in Canada for over four years. A preliminary report on that study was made to the Highway Research Board in 1946 by the author of these articles. Since then the studies have been carried to the point of developing a design method based on the findings, which indicate that very considerable savings can be made in the construction of flexible pavements when compared with the cost of pavement built according to currently used methods for determining thickness.**

To provide our readers with a background against which to evaluate the proposed design method, Norman W. McLeod, who is directing the investigation, in the articles beginning in this issue, gives an outline of the test procedures and a summary of the test results. He also discusses the significance of the test results, and finally, gives the design curves proposed as a result of these studies by the Canadian Department of Transport and compares them to design curves used currently in the United States.

Part I—Preliminary Field Studies

THE WESTERGAARD analysis for determining the thickness of rigid pavements has been widely accepted for many years. But no method of design for establishing the required thickness of flexible pavements so far proposed has received more than very limited recognition—although more than twenty methods have been suggested during the past fifty years[1].

Because of the lack of fundamental information on the required thickness of flexible pavements for airports, there has been some tendency to adopt a conservative approach to this design problem. This tendency toward overdesign appears to have been accentuated during the second World War, and could probably be justified during the war period because of the uncertainty concerning many of the design variables, the necessity for an enormous number of airports—frequently built under the supervision of engineers who had little or no previous experience in this field—and the need for runways that would be serviceable under all conditions for military operations.

TABLE I — TRAFFIC DATA FOR MONTREAL, TORONTO, WINNIPEG & LETHBRIDGE AIRPORTS (From Jan. 1, 1941 to Jan. 31, 1947)

Airport	Overall Thickness Pavement and Base Inches	Average C B R Value Soaked Subgrade Samples	Wheel Load Rating U. S. Corps Of Engineers Design Curves	Actual Traffic Data To Nearest Full Thousand Number of Operations of Aircraft Weighing More Than 7,500 lb.	15,000 lb.	25,000 lb.	50,000 lb.	64,000 lb.
*Montreal	14	3.1	5,000			211,000	89,000	23,000
Toronto	8 to 10	3.5	2,000 (approx.)	299,000	79,000	41,000	3,400	3,000
Winnipeg	8"-2 rwys 14"-1 rwy	3.3	2,000 5,000	319,000	96,000	25,000	several hundred	
*Lethbridge	6 to 8	4.6	2,000 (approx.)	229,000	35,000	4,400	several hundred	

* Traffic data for period Jan. 1, 1942 to Jan. 31, 1947.

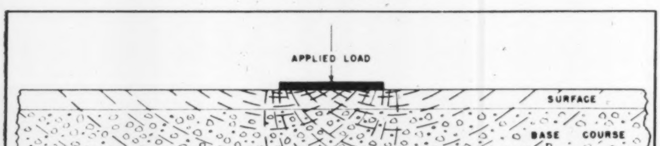


FIG. 1. DIAGRAM OF SHEAR PLANES under a loaded area of flexible pavement.

Now, however, in view of the vast experience with airport construction provided by those war years and the tremendous construction costs that a number of the runway designs being currently advocated involve, the time has come to take a long critical look at the problem of airport runway design. It must be determined if and how economies in runway construction can be effected without interference with the safety of operations.

A major highway problem

Replies to a recent questionnaire sent out by the Highway Research Board to highway engineers in the U. S. indicated that the load-supporting capacity of subgrades and base courses is the most important highway engineering problem awaiting satisfactory solution at the present time. It is of interest that this problem also received the highest priority among highway engineers in the province of Ontario in a questionnaire sent out by the recently formed Advisory Committee on Highway Research of the Ontario Research Council.

Consequently, the overall thickness required in flexible pavement design appears to be the most important problem facing both airport and highway engineers, for which a solution is required now. Because of the lack of any adequately established method of flexible pavement design, engineers in general can only guess at the thickness of flexible pavement (granular base and bituminous surface) required for any project, basing their guess very largely upon past experience.

Fig. 1 illustrates the specific nature of this problem of the supporting value of subgrades and base courses, (flexible pavement design). When a load is applied at the surface of a runway or highway with a flexible pavement, shear stresses are developed in each of the underlying layers,—surface, base course and subgrade, as shown. If the applied load is so large that the shearing strength of any one of these underlying layers is exceeded, the material will move downward, laterally, and upward along one or more of the planes of shear through the layer. This will result in rutting of the surface directly under the wheel, and upheaval of the adjacent surface.

The design problem

These articles are concerned only with the problem of preventing subgrade failure under load: the prevention of detrimental movement of the subgrade soil, downward, laterally and upward along the shearing planes in the subgrade. For any given subgrade, the only practical answer that we have to this problem now is to provide a sufficient overall thickness of base course and bituminous surface between the wheel load and the subgrade. The fundamental design problem therefore consists of ascertaining the minimum thickness of material needed for this purpose. This in turn requires two basic items of information.

(a) What is the supporting value of the subgrade?

(b) What is the supporting value of the granular base course and bituminous surface per inch of thickness.

When these two items of information have been obtained, the minimum overall thickness required can be calculated from the fact that the supporting value of the subgrade, plus the supporting value of the granular base and bituminous surface per inch of thickness multiplied by their respective thicknesses, must be equal to the wheel load to be carried.

The design and construction of airports and highways in Canada is

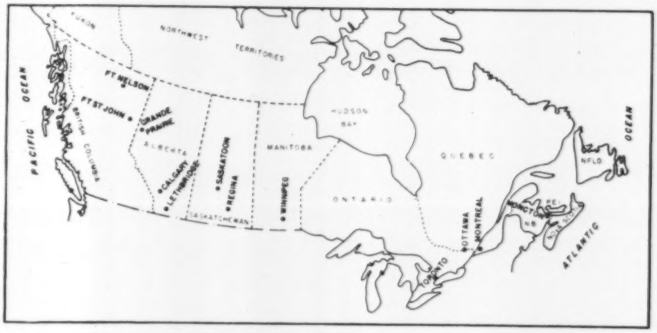


FIG. 2. LOCATION OF AIRPORTS where tests were made on pavements and bases.

TABLE II—GENERAL DESCRIPTION OF THE AIRPORT SITES TESTED

					Subgrade		
Airfield	Depth to Water Table	Pavement	Base course	Sub-base	PRA Classification	L.L. Av.	P.I. Av.
Ft. St. John	Deep	3.5 to 6 in. RC-4 & 150 180-pen. Bituminous mixture	5.5 to 10 in. Crusher-run gravel	5.0 to 17.0 in. Pit-run gravel	A-7	49.2	27.0
Grande Prairie	Deep	2.0 to 8.0 in. SC-5 Bituminous mixture	6.5 to 16.5 in. mechanical stabilization and gravel	None	A-7	63.9	38.5
Saskatoon	Deep	1.5 to 3.5 in. SC-5 bituminous mixture	4.5 to 6.5 in. gravel	None	A-7 A-6	46.5	23.7
Lethbridge	Deep	1.5 to 3.5 in. SC-5 bituminous mixture and surface treatment	4.0 to 7.5 in. gravel	None	A-7 A-6	39.5	20.0
Dorval (Montreal)	4 ft. to 6 ft.	4.0 to 6.0 in. Pen. macadam, sheet-asphalt top	3.0 to 5.0 in. water-bound macadam	3.0 to 9.0 in. pit-run macadam	A-4 A-7 A-6	33.7	13.4
Winnipeg	Deep	3.0 to 4.0 in. SC-5 bituminous mixture	5.0 to 10.5 in. mechanical stabilization	None	A-7	64.4	36.7
Malton (Toronto)	Deep	3.5 to 9.0 in. SC-5 bituminous mixture	1.5 to 7.0 in. gravel	None	A-4 A-7 A-6	32.1	13.8
Uplands (Ottawa)	Deep	2.0 to 3.0 in. SC-5 bituminous mixture	2.3 to 6.0 in. gravel	None	A-2	18.8	0
Ft. Nelson	2 ft. to 3 ft.	4.5 to 5.5 in. 150/180-pen. bituminous mixture	6 to 10 in. pit-run gravel	None	4′ to 5′ of sand over clay	24.8 (for Clay)	10.4
Regina	Deep	0.5 to 1.0 in. surface treatment	5.0 to 7.0 in. mechanical stabilization	None	A-7	72	38
Calgary	Generally deep	2.5 to 3.0 in. SC-5 bituminous mixture	3.5 to 8.0 in. crusher-run gravel	None	A-4 A-6	29.1	9.1
Saskatoon (No. 2)	Deep	3.5 in. asphaltic concrete	12 in. mechanical stabilization	None	A-7 A-6	40.3	20.7
Moncton	Deep	3 to 4 in. SC-5 bituminous mixture	3 to 4 in. crusher-run gravel	18 to 19 in. sandstone 3 to 5 in. gravel	A-6 A-4	29.3	11.7

materially influenced by the airport and highway engineering practice of our neighbour to the south. However, experience accumulated during the past ten or twelve years by the principal engineers of the Dominion Department of Transport (which has been responsible for nearly all airport construction in Canada) has indicated that the methods for determining pavement thicknesses for airport runways—are being currently advocated by some of the principal organizations in the U. S.— are unnecessarily conservative[2]. In particular, it is felt that pavement thickness design based upon the California Bearing Ratio (CBR) rating of soaked subgrade samples[3] could not ordinarily be justified for airport runway construction in Canada.

That airports with relatively thin pavements throughout Canada have for a considerable number of years successfully carried wheel loads that are several times their safe carrying capacity according to some U. S. designs, is illustrated in Table I, which gives data for representative airfields. Because of the publicity that was given to their method of airport runway design during the war just concluded, and their published reports on the large scale investigations which they have made in this field, it is common practice to compare runway experience and design elsewhere with that which is advocated by the Corps of Engineers, U. S. Army, in their "Engineering Manual"[3]. It is for this reason that their design requirements are listed in Table I as the yardstick for comparison with Canadian experience.

Canadian airport engineers have been interested to observe that their own experience, as represented by Table I, has been adequately confirmed recently by Palmer[4, 5], with regard to airports investigated by the Bureau of Yards and Docks of the U. S. Navy. A recent concise statement of the U. S Navy's findings after evaluating 58 airports within the United States, appeared on page 71, ENGINEERING NEWS-RECORD, Nov. 11, 1948.

TABLE III—COMPARISON OF SUBGRADE CHARACTERISTICS AT THE AIRPORTS

AIRPORT	Average ratio of subgrade field-moisture content versus plastic limit and versus optimum moisture (Modified AASHO) Field moisture versus plastic limit (percent)	 Field moisture versus optimum moisture (percent)
Lethbridge	65.0	84.2
Saskatoon No. 2	81.8	114.2
Grand Prairie	85.0	113.6
Regina	85.1	147.5
Calgary	90.7	167.0
Moncton	96.4	183.2
Saskatoon No. 1	97.0	127.1
Fort St. John	99.3	140.4
Dorval (Montreal)	100.0	186.9
Winnipeg	108.0	136.4
Malton (Totonto)	114.3	159.2
Overall Average	93.0	141.8

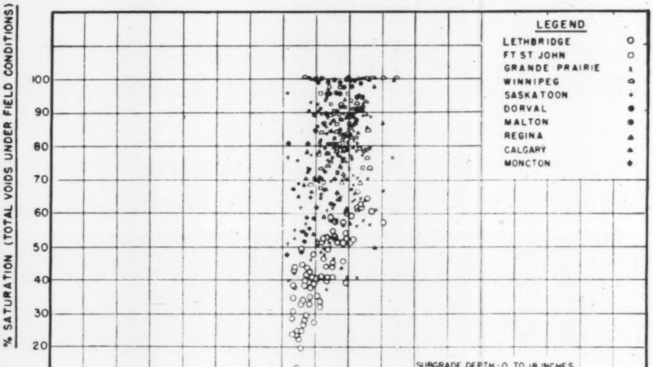


FIG. 3. PERCENT OF SATURATION of subgrade under field conditions plotted against percent of maximum density.

Because of the necessity for developing a method of airport pavement thickness design in accordance with Canadian experience, the Dominion Department of Transport undertook an investigation of runways at a number of Canadian airports in the early spring of 1945. This testing program is still going on. Some of the principal objectives of this investigation are:

(1) By means of repetitive plate bearing tests on subgrade, base course, and surface, to obtain load test data that can be employed for the design of either rigid or flexible pavements.

(2) To determine the field moisture content and density of the base course and subgrade in place at each test location.

(3) To perform cone bearing, Housel penetrometer, field CBR and triaxial-compression tests on the subgrade, and to attempt to correlate them with the corresponding repetitive plate bearing tests.

(4) To obtain undisturbed subgrade samples for CBR (both field and soaked conditions), triaxial-compression, shear, and consolidation tests, and disturbed samples of base course and subgrade for mechanical analysis and the usual physical and compaction tests.

(5) To determine from the load test data the supporting value of subgrades, and the supporting value of granular base courses and bituminous surfaces per unit thickness, and from this information to derive an equation or set of curves which could be employed for the design of flexible pavement thickness requirements.

Since the Department of Transport has no large central testing laboratory of its own, arrangements were made to have the necessary laboratory tests on the large number of samples taken in the field, performed by the engineering laboratories at the University of Alberta under R. M. Hardy; at McGill University under G. A. Leonards, and at the University of Toronto under Robert F. Legget and R. L. Davies.

Tests at thirteen airports

Fig. 2 indicates the wide geographical distribution of the thirteen airports investigated up to the present time. A general description of the subgrade, sub-base, base course, and bituminous surfacing at each of these airports is contained in Table II. At Uplans Airport, at Ottawa, the subgrade consists of about 80 ft. of clean sand, and at Fort Nelson, there is from 3 to 5 ft. of clean sand over clay. At the other eleven airports, the subgrade is clay or clay loam.

This investigation is being made on existing paved runways, nearly all of which have been in service for a number of years, and not on newly constructed test sections. Consequently, there has been time for reasonable equilibrium of moisture and density conditions to develop in the subgrade and base course. The types of test equipment, the testing procedures, and the methods of recording the data, were identical for all test locations, in order that a common basis would exist for correlating the data obtained at the different airports.

It will be noted that the runways at all airports included so far have flexible pavements. The Westergaard equations for determining the required thicknesses of rigid pavements have been thoroughly tested by other organizations over the years, and are widely accepted. Flexible pavement design on the other hand, has until quite recent received very little fundamental study, probably because of the inherent difficulties involved, and it was in the field of flexible pavements that the experience of Canadian airport engineers appeared to be at such variance with the design requirements of several principal organizations in the U. S.[2]

Field moisture and density studies

In Fig. 3, the percent saturation of the subgrade, under field conditions, is plotted versus the subgrade density measured in the field and expressed as a percentage of the corresponding AASHO maximum density. Complete saturation occurred at very few test locations, and the number of the test locations where the degree of saturation exceeded 90 percent of the available void space, was also relatively small. The field density varied from about 75 to 95 percent of modified AASHO maximum, with an overall average of about 85 percent. Proctor compaction of the subgrades had not been employed during construction, with the one exception referred to later.

Figs. 4 and 5 provide graphs of field moisture content versus the corresponding plastic limit, and versus optimum moisture (modified AASHO), respectively, for all subgrade samples. A reasonable estimate of the anticipated subgrade moisture content at a new site can be made from graphs like those of Figs. 4 and 5, prepared for similar subgrade soils and drainage conditions under other paved projects in the same geographical region.

In Table III average ratios of the field moisture content versus the plastic limit, and versus the modified AASHO optimum, for the top two feet of the subgrade at airports with cohesive subgrade soils are given. It indicates that in terms of average values, the field moisture content exceeded the plastic limit at two airports, was approximately equal to the plastic limit at four airports, and was materially less than the plastic limit at five others. The field moisture was less than the optimum moisture content at one airport, and exceeded 150 percent of optimum at four airports. The arrangement of the eleven airports in an ascending or descending sequence is different in terms of the ratio of field moisture to plastic limit from an arrangement in terms of the ratio of field moisture to optimum moisture.

The grouping of the individual sur-

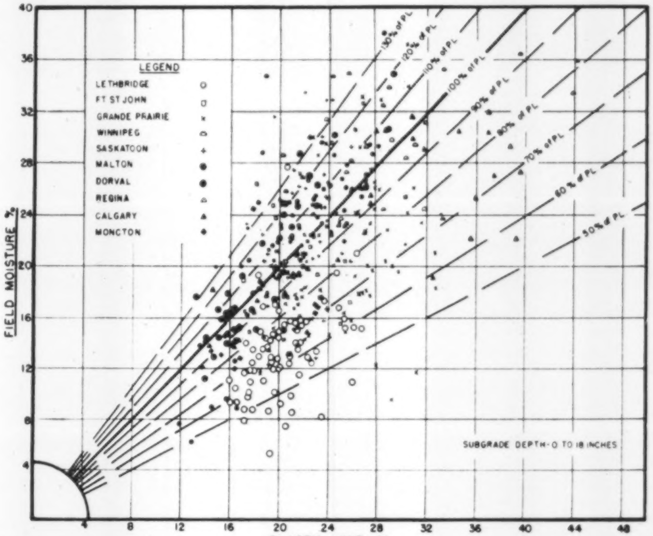


FIG. 4. PERCENT OF FIELD MOISTURE of the airport subgrades plotted against the plastic limit of the soils.

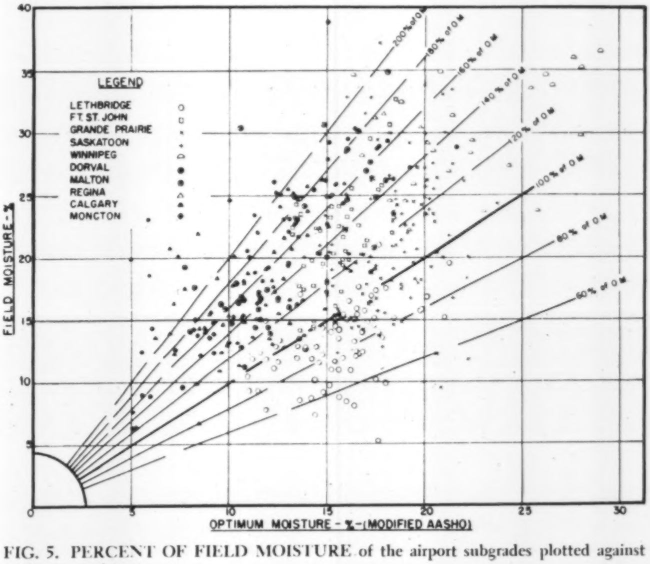


FIG. 5. PERCENT OF FIELD MOISTURE of the airport subgrades plotted against optimum moisture.

face, base-course and subgrade plate bearing tests, and of the other tests at each test location, is illustrated in Fig. 6, and the arrangement of equipment for performing each load test is shown in Fig. 7. The bearing plate normally employed was 30 in. in diameter, but to obtain comparative data, two or more of the 12, 18, 24, 36 and 42-in. diameter plates were also frequently used. The reaction weights for the four load-test units in operation, consisted of truck-trailers loaded to from 70,000 to about 120,000 lb., Fig. 8.

Repetitive plate-bearing tests were employed. Measured load was transferred from a jacking point on the trailer to the bearing plate by means of a hydraulic jack of 100,000-lb. capacity. Deflections were measured to the nearest 0.0001 in. by means of Ames dials set near the extremities of a diameter of the plate. A load giving a deflection of 0.03 to 0.05 in. was first applied, a stop watch started, and the same load maintained until the increment in deflection was 0.001 in. per minute or less for each of three successive minutes. The load was then released, and the deflections recorded until the rate of recovery was 0.001 in. per minute or less for each of three successive minutes.

The same load was applied and released six times in this manner. The load was next increased to give a deflection of about 0.2 in., and the same operations for application and release of load were repeated from four to six times. Finally, the load was increased to give a deflection of 0.35 to 0.4 in., and the same procedure followed as before as the load was applied and released from four to six times (always six times for the more recent work). Readings of both deflection gages at the end of every minute were entered in field note books to provide a permanent record.

The three deflections 0.05, 0.2 and 0.4-in. were selected because at all test locations load test data were required that could be used for the design of either rigid or flexible pavements, if extensions or reconstruction should become necessary at any one of these airports. The critical deflection for rigid pavements is commonly taken to be 0.05 in., and for flexible pavements is stated by the Asphalt Institute to be 0.5 in. The third intermediate deflection of 0.2 in. was selected to provide a complete load deflection curve when the data were plotted.

The test procedures employed for field moisture and density, cone bearing, Housel penetrometer, California Bearing Ratio (CBR), triaxial compression, and other field laboratory tests, were standard, and are generally familiar.

Zero point corrections for applied loads and recorded deflections were made to the load test data for each plate bearing test.

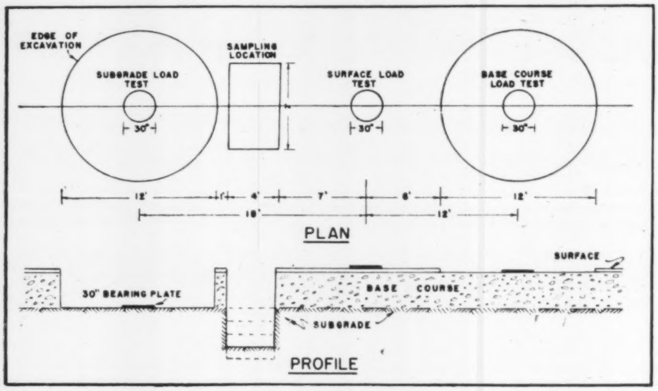


FIG. 6. **TYPICAL ARRANGEMENT** of load tests on the airport pavements and bases and location of subgrade samples.

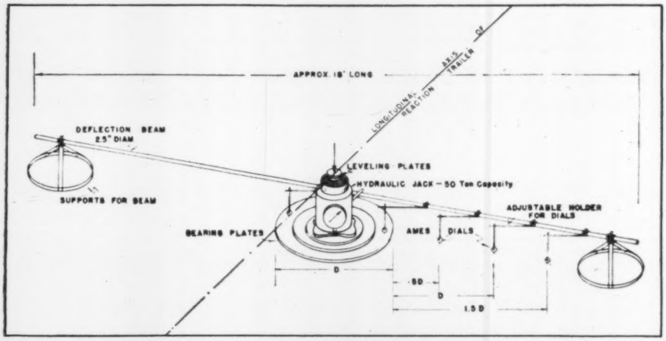


FIG. 7. **ARRANGEMENT OF THE EQUIPMENT** used in making the load-bearing tests on airfield runways.

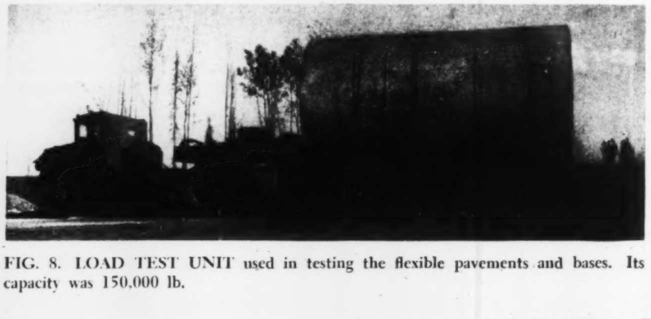


FIG. 8. **LOAD TEST UNIT** used in testing the flexible pavements and bases. Its capacity was 150,000 lb.

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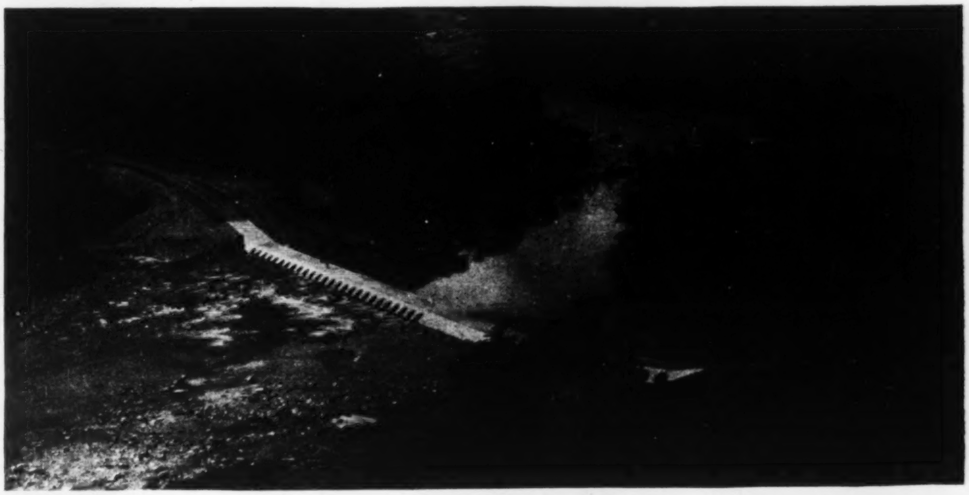
Part II of this group of four articles will be published May 12.



For a highway crossing the bed of a mountain stream in a tropical climate . . .

Concrete Pipe and Steel Rail Make Effective Flood Bridge

FREQUENT FLOODS dictated design of a 480-ft. crossing of the Haina River in the Dominican Republic as a structure that could be overtopped occasionally, and has in fact been under water three times since its completion last October. During extreme flood periods, water may rise as much as 6 ft. over the roadway.

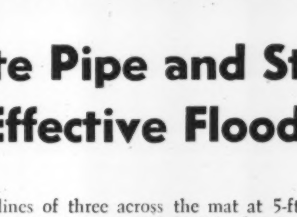
Located about 20 miles from Ciudad Trujillo, the capital of the country, the flood bridge carries one lane of traffic on the road to Isa Reservoir and the Mana River pumping station (a newly developed water-supply source.)

The unique structure is formed of 54 in. dia. precast concrete pipe in 4 ft. lengths, set on a poured concrete base and tied together by a welded steel rail frame. Its foundation is a mass concrete mat poured in a 2½-ft. deep x 25-ft. wide channel cut out of solid rock. This channel had to be dynamited through most of the 480-ft. length of the bridge. The poured foundation averages 3 ft. in thickness and is not reinforced.

The bridge is held down by lengths of 60 lb. steel rail grouted vertically into 8-in. diam. holes that were left in the foundation mat. These rails, in lines of three across the mat at 5-ft. centers, are spaced 8 ft. 8 in. longitudinally. They extend upward, clear of the mat, about 7 ft., so as to reach 6 in. above the sections of pipe.

Bevelled-end pipe

Three lengths of pipe pass under the 12-ft. roadway and connect to a special bevelled-end section at either side. These end sections were cast with two rails running through them perpendicular to the pipe axis and extending out 12 in. on each side. After a complete line of three pipes was in place (with the bevelled section at each end) rails were welded along either side to these end-section dowels. Thus, the line of pipes was tied together into a rigid unit.



SPECIAL SECTIONS of pipe, bevelled on one end and cast with steel rails set in their bottoms, were used at upstream and downstream ends.

As each line was completed, it was tied to the next by short lengths of rail welded to the transverse ties. Then three lines of rails were passed over the tops of the pipes and welded to the tops of the vertical rails that had been grouted into the concrete foundation.

When this welded steel framework had been completed, mass concrete was poured in the spaces between pipes. Wooden forms used were bolted to the end sections of the pipes; nuts to receive form bolts had been cast into sections when they were poured. Thus, forms were placed, removed and re-used with a minimum of effort.

A 10-in. thick roadway was poured on top of the pipe. Curbs 5 in. high at each outer edge are tied to the road-

RAIL REINFORCEMENT in place for concreting the approach. Immediately beyond, four pipe lengths are ready to be finished off by pouring of the 10-in. roadway slab.

way slab with ⅜ in. dia. reinforcing bars welded to the outside longitudinal rails which pass over the pipes and are embedded in the concrete of the floor slab.

Approaches at either end of the structure are anchored to—and rest on—the 3-ft. thick mass-concrete footing and are liberally reinforced with steel rails. Approach sections are composed of the roadway slab and two side slabs inclined at 45 deg. angles to conform with slope of bevelled ends of precast pipe sections.

In both the inclined and the roadway slabs steel rails were placed 3 ft. on centers in a concrete thickness of 18 in.

The structure required about 3,300 cu. yd. of concrete and 50 tons of rails and reinforcing steel. Concrete aggregates were taken from the river bed in the vicinity of the bridge.

Lock Joint Pipe Co. of East Orange, N. J., built the crossing as part of its portion of an extensive public improvement program being carried out in the Dominican Republic.

Refuse Group Values Loading Device

Probably the most important development in the field of refuse collection and disposal is the development of mechanical loading devices for collection vehicles, a committee of the American Society of Civil Engineers said recently.

The statement was contained in the first of a series of progress reports submitted by the Committee on Refuse Collection and Disposal, Sanitary Engineering Division of the ASCE. The committee was appointed in 1947, with the assignment of "evaluating present practice in the collection and disposal of refuse and other community wastes, inquiring into newer processes available for disposal, and studying the use of chemicals and other agents for control of vermin."

Most important result of mechanization of collection vehicle equipment, the report said, is the need for a series of standard designs that would meet the need of smaller cities for special-purpose equipment at reasonable cost.

Commenting that "one of the serious situations which has arisen in the selection of mechanical loading equipment on refuse collection trucks is the necessity for purchase of standard designs," the committee said that cities that have tried to modify standards set up for New York City and other large communities have found that such modifications would make the cost of manufacture prohibitive."

It suggests that the ASCE and American Public Works Association make a cooperative effort to promulgate standard designs, to be worked out with equipment manufacturers, to make possible production of equipment that could be adapted for use in smaller cities.

Other comments in the first progress report included a demand for enactment of reasonable ordinances and establishment of collection frequencies and planning of collection routes and procedures to utilize personnel and equipment to the highest effective degree.

Incinerators cost too much

Another part of the report was concerned with operation and effectiveness of incinerators as a means of disposing of refuse—a problem of major current concern to municipal engineers.

Greatest drawback to the installation of incinerators is their cost—both of construction and operation—the committee said. "The U. S. Public Health Service Survey showed that 1,090 incinerators are needed for municipalities throughout the country, and based on 1948 prices the costs would total about $100,000,000."

"Cost figures are not easily evaluated, but some large incinerators bid during 1947 and 1948 showed costs ranging from $100,000 to $200,000 per 100 tons per 24 hr. capacity. In addition, operating costs may range 50 cents to $1.50 per ton of refuse destroyed.

"In view of these costs, many cities have given serious consideration to other means of disposal."

Committee members noted that one of the greatest advances in the design of incinerators has been adoption of mechanical stoking equipment within the incinerator. Tests conducted at Detroit, Tonawanda, N. Y., and Winnipeg (Canada), showed that higher burning rates may be utilized than the conventional 50 pounds of refuse per hour per square foot of inside horizontal furnace area usually accepted.

"An important problem arises in evaluation of bids," the committee added, for construction of manually and hand-stoked incinerators. The actual low bid from the standpoint of total construction costs for furnaces, accessories and buildings, may not be the most desirable on the yearly cost basis. Differences may arise in the need for power for blowers and stoking equipment, and the number of men required to operate the incinerators."

Committee members are: Rolf Eliassen, chairman, and Francis S. Friel, Norman W. Nester, Newell L. Nussbaumer, Warren A. Schneider and Henry W. Taylor.

CONSTRUCTION AT AMUAY BAY began in 1946, when this earth-fill pier was built for unloading tools and materials for the creation of the . . .

FOURTH LARGEST OIL PORT IN THE WORLD, where Creole Petroleum Corp. has established a $120 million oil refining plant and shipping point.

Builders Beat Waves and Weather On Pipeline Under Venezuelan Gulf

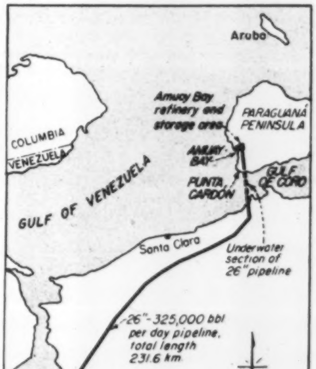
THE WORLD'S fourth largest oil shipping port is now in operation at Amuay Bay on the Gulf of Venezuela —145 pipeline-miles from its crude oil sources at Ulé on the shore of Lake Maracaibo.

Part of the $33,000,000 pipeline, which serves the Creole Petroleum Corp.'s installations at Amuay, had to be laid 14½ miles across the bottom of the Gulf of Coro. The first method of laying this underwater length of pipe was fouled by the weather; the second try was successful.

At Punta Cardon, on the Paraguana Peninsula end of the line, a 6,000-ft. railway was built leading down a gradual slope into a dredged slip. Adjacent to this railway the pipe was prepared for immersion. The preparation included: a primer coat, 1/16-in. of enamel, a wrapper of glass floss, more enamel, a second wrapper of glass floss, more enamel, a layer of asbestos felt and, finally, reinforced mortar to make total coating thickness 1½ in.

Then the pipe was rolled onto dollies on the railway, to be welded into a continuous line. The outer end was sealed, and as sections were added to the "string," it was pushed onto the water to float between pairs of timber piles set 20 ft. apart and spaced every 300 ft. from one beachhead to the other. When the whole line had been floated across the gulf inside the piling guides, it was to be filled and sunk into position.

The schedule called for the joining and floating operation to be completed in about five weeks, in a period when the trade winds were at their lowest. Nearly two miles had been assembled and floated when the unexpected happened. Wind was "normal" —about 35 miles per hour from the east, directly across the path of the line. But a record high 7-mile per hour current from the west, complete with rip tides and 10-ft. waves, put a 90 deg. elbow in the floating pipelines and ripped out most of the timber piles.


Aruba
Amuay Bay refinery and storage area
PARAGUANÁ PENINSULA
COLUMBIA
VENEZUELA
AMUAY BAY
GULF OF CORO
PUNTA CARDÓN
GULF OF VENEZUELA
Santa Clara
Underwater section of 26" pipeline
26"-325,000 bbl per day pipeline, total length 231.6 km
Ulé
LAKE MARACAIBO

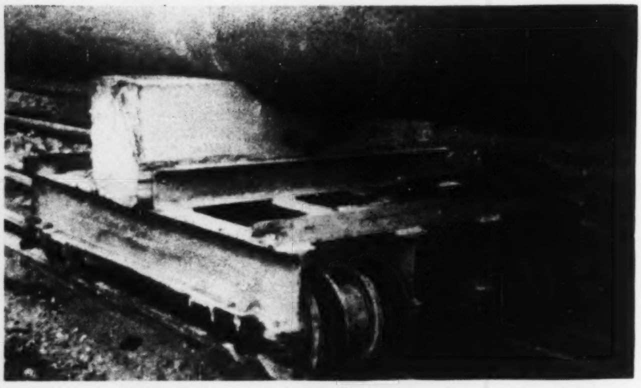
THE OVERALL PROJECT will bring oil from Creole's base at Ule to the refinery and shipping point at Amuay Bay, via a 26-in.-dia. pipeline.

Second Try Works

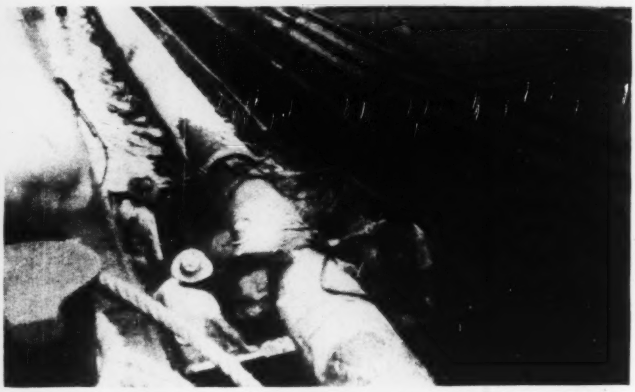
In the second and successful attempt, construction progressed in the opposite direction—south to north. This time 3,500-ft. sections of pipe were coated and welded at the railway site, then sealed on both ends and towed into the gulf. These prepared lengths were to be joined out over the water.

Meanwhile, two 110-ft. barges were fastened together to make an above-water work platform of great weight-carrying capacity. Between the barges, near the water line, a 10 x 20-ft. plate-steel welding box was built.

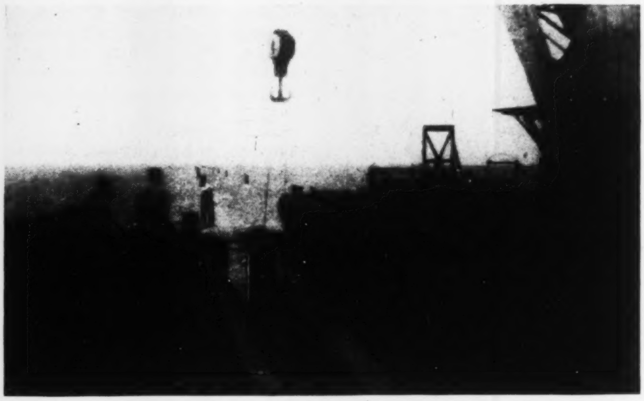
With two 75-ton cranes, and chain hoists set on steel piling driven into the gulf floor, the ends of the line extending out from shore and the floating sections were hauled up about a foot out of the water. These ends were then lined up and clamped into position in the welding box, for joining and coating. The sections were then lowered, filled with water from the shore end and sunk into position.



RAIL MOUNTED DOLLIES carried the pipe from the shore (after guniting for immersion protection) down a 6,000-ft. runway into the water.



FLOATING SECTIONS OF LINE were joined by welders who worked in a 10 x 20-ft. plate-steel box, suspended between two 110-ft. barges.



CRANES on barges lifted floating pipes clear of the water for welding. Chain hoists set on steel piles held pipe firmly for joining.

This process of connecting 3,500 ft. sections was continued to a point 6 miles out from the peninsula where the winds and currents are strongest and most dangerous. There, the final joint was made with a floating section 6 miles long. With the final joint made and the 6 mile stretch added and sunk into position, the underwater pipe-line was completed.

Overland section easier

Creole pipe-line officials and field men of the contractor, Williams Bros. Corp., New York City, called the 130-mile overland section of the pipeline "more or less a routine job"—except for weather peculiarities. A total of over 111,000 tons of pipe and materials for the line was shipped in from the United States. Part went to Lake Maracaibo to be trucked out as the right-of-way was hacked through the jungle. Over 35,000 tons were unloaded at a beachhead established at Santa Clara, two-thirds of the way out. The remainder went to Amuay Bay to be trucked or lightered to the beachheads at either end of the underwater section.

Exceptional weather conditions presented problems even in the overland construction job. For example, at one time two 35-ton truck tractors, loaded with pipe, started following their lead jeep across one of the numerous rivers bisecting the line. The jeep got across, but both trucks were hit by a 10-ft. wave of water from a flash flood, a common occurrence in that area. When the water subsided, only the top of one truck cab stuck up out of the sand and muck; the other truck was located by probing. During probing to locate the pipe, two additional jeeps were unearthed, forgotten victims of earlier flash floods.

Building the port

Although the pipeline is completed, the refinery under construction at Amuay Bay is not expected to go into operation until late 1951. First work on it started in October, 1946, when an earth pier was built out into the bay to receive heavy equipment unloaded from freighters and barges.

At about that same time, Gahagan Construction Corp. of New York City started dredging some 4,000,000 cu.yd. of muck out of the bay to create a 35-ft. channel to receive ocean-going tankers.

As soon as the dredging was completed, Merritt-Chapman & Scott moved in on a $3,000,000 contract for construction of the main pier which had been designed by the Knappen Tippett Abbett Engineering Co. of New York City. This pier consists of a

1,300-ft. approach trestle and three all-welded steel fingers extending out from it on steel H-piles.

Since all the material for the refinery and its appurtenances has been moved into the area by water, the port has already assumed major proportions. Last year, for example, imports for the whole job ran about 400,000 tons. This figure is comparable to one year's imports at La Guaira, Venezuela's biggest general cargo port.

In exports the port is already on its way to becoming an important facility. Even before the pipeline was completed, crude oil—moved from Lake Maracaibo by lake tanker—was being received at the port and exported at the rate of 1,400,000 barrels per month. With the pipeline completed, an increase in this export figure will depend upon completion of storage facilities now under construction.

Refinery construction continues

Chicago Bridge & Iron Company currently is building eleven 150,000-barrel floating-roof tanks, said to be the largest of their type in the world. Hammond Iron Works of New York has built nine 150,000-barrel cone-roof tanks. Total storage capacity of the Amuay Bay project will be 6,000,000 barrels.

For temporary housing in the area, Creole engineers modified 24-ft. Quonset huts to contain three bedrooms, bath, kitchen, dining room, living room and two screened porches. Nearly 130 such family units, plus ten triplex apartment units, and some 40 units for bachelor men and women, have been built to care for the 700 U. S. employees of Creole and its contractors.

Permanent housing for the refinery area has been designed in conjunction with Creole engineers by architects Skidmore, Owings & Merrill of New York. Individual homes for the 2,500 nationals who will be on the permament refinery operating staff are being pushed to completion first, since at present all nationals live off the refinery site.

Fresh water for the project will be brought in at the rate of 225,000 barrels a day by a 30 and 34-in. pipeline running 65 miles into the mountains to the south. Creole is building the line, but it is a joint operation with Shell Oil, which is also building a large refinery on the peninsula.

J. G. White Engineering Corp., New York City, as part of its contract, is turning out 5,000 concrete blocks per day for the housing program. Also, this company is building the main power plant, which is to consist of two boilers and three 7,500 kw. steam turbo-generators. The company has also built and is operating a 1,000 cu.yd. per day concrete batching plant; it operates and maintains a general equipment pool for all contractors; and it is to construct the 57 miles of paved streets in the residential areas.

In number of operations, the refinery will be the largest in continental South America. It will produce aviation gasoline in sufficient quantities to supply all Venezuela's needs; a new type high octane motor fuel; lube oils, some of which are now imported by Venezuela; diesel oil; fuel oil; kerosene; and solvents.

High Cost of Quantity Surveys Works Against Their Adoption

Leslie H. Allen
Quantity Surveyor
Newton Highlands, Mass.

CONSIDERABLE comment on quantity surveys has been stirred up by R. D. Sannit's article entitled "Do Our Estimates Cost Too Much?", in the Dec. 9 issue of ENR (p. 107). Since I have passed the professional examinations for quantity surveyors in England referred to by T. Forster, (ENR March 3, p. 57) and spent 15 years in quantity surveying over there, followed by more than 30 years in construction work in the United States, I can speak from experience on both sides of the water.

Bids were recently invited for a local high-school. Ten builders submitted bids, the average being slightly under $2,000,000. In one office the estimator spent 119 hours in taking off the quantities, and two days more were occupied in pricing, visiting the site and assembling the subcontractors' bids. This firm estimates that the preparation of its bid cost about $500, and it is probable that the nine other contractors' costs were about the same. Sub-bids were required for 42 items, and 131 firms submitted bids for these. On some of the larger items such as plumbing and heating, each sub-bidder must have spent at least a week, and even on the smallest items a day or more was certainly occupied in preparing a bid. In the aggregate, 250 days or more were spent by subcontractors on this project, and the total cost of making up estimates amounted to about $10,000 for the building trade.

If the contract had been awarded to the low bidder, he and his subcontractors at least would have been compensated for their outlay, though the unsuccessful bidders would have lost the money that they had spent. On this project all bids were rejected and the entire cost of bidding was lost.

This is not an exceptional case—it is typical of our wasteful system of bidding. The same procedure is followed every week in hundreds of similar jobs in every state in the union. The quantity of material required for each building is the same, no matter who gets the job, and it does seem inefficient and uneconomical for ten men to labor for two or three weeks to compute quantities when one man could do the work as well for them all.

British use quantity surveys

On a similar project in England, by contrast, the architect would engage a quantity surveyor to compute the quantities of work and material required in each trade, and would issue these to the competing builders. Each builder would spend two or three days in preparing and pricing his bid and most of the subcontractors would spend less than one day each. The cost of the quantity survey would be carried as an allowance in each contractor's bid, and would be paid by the successful bidder, or, if bids were rejected, by the owner.

About 35 years ago, the late G. A. Wright of San Francisco initiated a movement to establish a system of professional quantity surveying in this country, and the writer spent some time in addressing meetings and writing articles on the subject at that time. However, it soon became evident that there was no real desire on the part of contractors to change present methods, and very little was accomplished.

Nevertheless, there are now a few quantity surveyors in some of our larger cities who offer their surveys to competing builders and sometimes succeed in selling their surveys to three or four of the ten or twelve competitors, but rarely, if ever, to all of them.

The English system is about 75 years old. In its early days, contractors agreed on one man to compute quantities for them all. Each bidder included the surveyor's fee in his bid, and the successful contractor paid it. If all bids were rejected, an equal share of the fee was paid by each bidder. Architects soon realized that, since the cost of surveys made in this way were eventually paid by the owner, it would be to the owner's and to the architect's advantage to appoint the surveyor. This is now the common practice.

System has many advantages

There are many advantages in this procedure: The quantity surveyor has more time to prepare an accurate survey, under better working conditions; being in closer contact with the architect he can straighten out questions that arise in the interpretation of plans and specifications far better than a builder's estimator can; the architect gets the benefit of a close scrutiny of his work by an experienced estimator, and errors and ambiguities can be corrected before bids are submitted instead of being the source of vexatious claims for extras later. Because all bids are based on the same quantities, there is not the wide spread between high and low bids due in many cases to inaccurate quantities taken off by the low bidder or to confusion in the assemblage of sub-bids. The quantity surveyor's familiarity with costs also enables him to advise the architect of the probable cost of each job in advance. Consequently, in England, it is very seldom that all bids are rejected because they overrun the owner's appropriation. Economies in design can be worked out before plans are completed and the time wasted by architects in redesigning and by builders in refiguring jobs—such a frequent occurrence here—is avoided.

British costs are high

In matters of detail, adoption of the British system would require extensive modification to ensure its usefulness here. In his desire to forestall claims for extras due to omissions or faulty descriptions, the English surveyor clutters up his survey with hundreds of insignificant items that the American builder never takes off and would not know how to price if he did. In the school job above referred to, the American builders' estimate occupied eleven sheets, but an English survey for the same project would have taken up more than one hundred pages. For this reason the British fees for such work are much higher than the American surveyor would have to charge.

One of the difficulties facing the professional quantity surveyor here, is the lack of uniformity in methods of measurement and estimating used by American contractors. The American Concrete Institute in 1915 published its "Rules for the Measurement of Concrete" (revised and reissued in 1926), but this lead has not been followed by others. If an American system comes into being, this problem will, in time, be adjusted by conference, and a standard method of measurement for each trade will be formulated.

Long training required

Another problem is the lack of facilities for training estimators. Quantity surveying cannot be learned by attending a course of ten or twelve lectures at a technical school or by reading a book.

In my early days, the young English surveyor had to serve four years as an articled pupil and was not eligible to sit for the examinations of the Surveyors Institution until he had done so. If quantity surveying became standard practice here, it must be started by the estimators of the leading contractors, and they would have to train younger men in their methods and, by conference with each other, evolve a uniform system.

The first steps towards the inauguration of such a system will have to be taken by contractors, either by mutual agreement on each job (to use the surveys of one man) or by the local builders' association underwriting the cost of forming a quantity surveying corporation, staffed by the best estimators in the city, and agreeing to use this organization's surveys on all jobs.

The cost of a survey made under such a setup would be about three times the cost of a survey made in a builder's office (owing to the overhead expense of rentals, stenographers and incidentals), but since this cost would be divided between ten or more bidders, the cost to each would be far less than he pays at present for estimating.

Guarantees not warranted

The question of whether the accuracy of a quantity survey should be guaranteed is sure to arise, but this is not so serious a point as it seems to be. No builder expects his estimator to guarantee that his work is correct. Under the difficult working conditions that prevail in most offices, it is usually approximately correct, but never exact and often there are large variations between the quantities calculated by the different bidders. If the same man who made that bid moves over into an office of his own under better working conditions and with a professional reputation to maintain, it is not likely that his work will be less accurate, and it appears probable that his work will be much more exact than formerly. If the fee charged is less than the amount the builder used to spend on quantity taking, it is not reasonable to require a guarantee also. No surveyor could afford to guarantee his work unless his fees were high enough to enable him to carry insurance against error, and such insurance would be costly and difficult to obtain.

If the architect or owner appoints the quantity surveyor, the situation is different. But the architect does not guarantee the accuracy of his designs, and if, in the course of construction, extra work is ordered to remedy defects in design, the owner has to pay the bill. The same logic would apply to the quantity survey. This point rarely arises in England, and when it does the owner usually pays.

The quantity surveyors now practising in America generally confine their work to the trades estimated and executed by the general contractor (earthwork, concrete, brick and stone masonry and carpentry). If quantity surveying is adopted here it will undoubtedly be limited, at first, to these trades. The logical next step will be to prepare surveys for all trades, and the general contractor will then supply copies of the quantities of plastering, painting, plumbing and the like to his sub-bidders. Some American surveyors do this now as a side line. The British contractor is so familiar with costs of subcontract work that he often prices most of the trades himself and does not consult with subcontractors until he is awarded the contract.

It is common practice in England to require the successful contractor to deposit a copy of his priced estimate with the architect at the time of signing contract, and this is used in the settlement of prices for change orders. The surveyor adjusts these by computing the quantities involved in each change and pricing them in accordance with the filed priced estimate. This is not an essential feature of the system and, as long as the appointment of the surveyor is made by the contractor, could not be insisted on here. But as soon as the appointment of the surveyor falls into the hands of the architect he will probably make this a requirement of the contract.

An economic waste

It is hardly correct to claim that the cost of our wasteful system of bidding is borne by the owner. It is an economic waste borne partly by the building trade and partly by the whole community. In the high-school case first cited it could not be proved that the taxpayers of that town paid any of the costs incurred by the building trade on their behalf, and the disappointed bidders are not going to add their losses on this bid to the amount they bid on future jobs. But the taxpayers as a whole suffer through reduced receipts for income taxes, corporation taxes and the like.

Poor plans increase costs

The owner does pay, however, when half-finished or inaccurate plans are issued for bids. Only too often the contractor has to guess at the architect's requirements—and his guess is usually a safe one. All bids are usually higher when poor plans are issued than they would have been if the plans and specifications were clear and accurate. If a quantity surveyor worked on such plans, he would confer with the architect and get doubtful points settled before he completed his survey.

There is no doubt that all contractors deplore the present inefficient system, but the attitude of most of them seems to be "as it was in the beginning, is now, and ever shall be".

There seems to be no real desire by the building trades for any change; or if there is such a desire, there is no concerted effort to improve the situation. It is useless to expect any cooperation from architects unless builders make the first move. Architects would find it too difficult to convince their clients of the advantage they would gain in return for the expense involved. Such advantage can be realized by experience only, not be argument.

I am confident, however, that the day will come when professional quantity surveying will become standard practice in America, and I hope that this day is not far distant.

Cities Achieve Broader Home Rule

HOME-RULE CHARTERS granting broad power of municipal self-government are in effect in at least 646 cities in 16 states, a recent study, "Home Rule for America's Cities," indicates.

Home rule may be provided either by legislative enactment or by amendment to the state constitution, according to the American Municipal Association, which prepared the study. Twenty-two states have made constitutional provisions for home rule, the study reveals, while six others—Florida, Georgia, Iowa, Mississippi, and North and South Carolina—have provided some degree of home rule by statute.

Constitutional home rule has operated exceptionally well in California, Colorado, Oregon and Texas. The report notes, "in those states the cities have been given the maximum amount of freedom and almost any city in them could be used as an example of the use of home-rule powers to satisfy public needs."

Michigan has 180 cities and towns with home-rule charters, more than any other state. Oregon has 107, Texas 99, Minnesota 78, and California 57. Other states whose cities have home-rule charters include Arizona, Missouri, Nebraska, New York, Ohio, Oklahoma, Utah, Washington, West Virginia, and Wisconsin.

Home rule is defined "a relationship between cities and their states in which the cities enjoy fullest authority to determine organization procedures, and powers of their own governments, and a maximum of freedom from control by either the legislature or state administrative officers." This includes power of cities to change or amend their own charters.

Cities without constitutional home rule are forever at the whim of state legislatures, the report states, citing recent efforts of the Louisiana legislature to gain control of New Orleans as an example of abuse of legislative power.

In states lacking home rule, the practice of legislatures passing local laws is a burden on the legislature, itself. During its 1947 session the Florida legislature approved 623 laws pertaining to purely local affairs while in the same year Alabama lawmakers adopted 369 local laws. Maine's legislature passed eleven local laws in its 1945-47 session.

Constitutional provisions

Three major constitutional provisions, necessary for cities to have effective home rule, are cited in the report. These constitutional provisions must:

1) "Protect cities against enactment of special or local laws." The enactment of laws which are not of statewide concern or which do not apply to all cities alike must be prohibited. Wisconsin's and New York's constitutions give cities this kind of protection.

The report states that if it is necessary to permit the enactment of some local laws in order to provide greater flexibility in local government, no such law should take effect until approved by the city concerned. This provision is made in the constitutions of New York and Illinois.

2) "Grant cities authority to frame their own charters." This authority should be given in terms that enable cities to put new charters into effect without action of the state legislature. The grant of charter making power should also authorize cities to amend their existing charters as well as to frame new ones.

3) "Give cities powers broad enough for them to provide maximum services for their citizens." This may be accomplished, the report states, by granting broad general powers to municipalities on matters of local concern, or by enumerating municipal power specifically. In case the latter action is taken, the courts should be instructed to interpret these powers broadly.

Wisconsin found it desirable to give its cities broad grants of general power covering all their local affairs and government. In Colorado, specific power is conferred on the cities by the constitution, but the courts are given clear instructions to interpret these powers broadly and not to construe them to deny other powers not expressly granted to cities.

Local federalism

As an alternative to the constitutional provisions set forth as essential to effective home rule for cities, the study suggests a system of local federalism. This would involve a declaration that the residual powers of government rest with the cities and that the state has only such powers as are delegated to it.

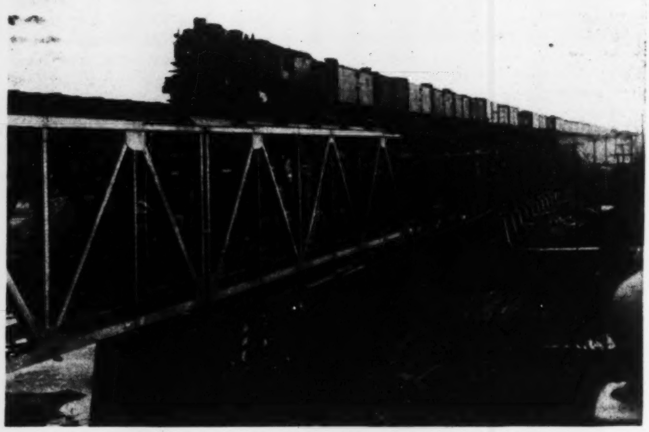
Such an arrangement would place city and state relations on a basis comparable to those of the states and national government. Under such a plan, according to the report, states should be empowered to handle situations which involve more than one unit of local government.

Related issues that may in some way facilitate the adoption and operation of self-government also are cited in the report:

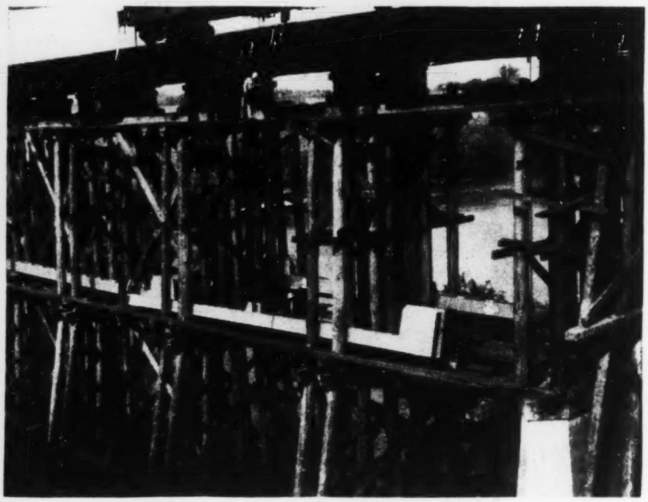
(1) Home rule should not be confined to large cities, but should be available to all having over 5,000 population, at the very least;

(2) Constitutional mandates should be used to help reduce conflicts between home-rule cities and states over division of tax source, control of local courts and authority to regulate; and

(3) Cities should be protected against burdens imposed by the state such as contributing to state expenses or to support state services.



Trains Move Over Bridge as . . .



. . . Truss Assembly Job Proceeds

MORE THAN HALF (530 ft.) of a 930 ft. bridge supporting a single-track line of the Southern Pacific Railroad was replaced in a 10-month period recently, while traffic continued without interruption.

During the working day, four passenger and several freight trains cross the San Joaquin River via the bridge; it was necessary to devise a work schedule that would permit the replacement of a substandard 50 ft. span and three obsolete 160 ft. spans while these trains used the structure. The bridge is located near Herndon, just north of Fresno, Calif., on the main San Joaquin Valley line of the railroad.

The three, deck-truss spans of this bridge—each 160 ft. long—were built in 1899 to better than average standards for that time (Cooper E-46 loading) and were considered adequate until recently. They had a complete system of floorbeams resting on and riveted to the top of the trusses; stringers were riveted to the floorbeams, and eye-bars were used for all main tension members and rods formed the bottom laterals.

Pin connections give trouble

But the trusses were pin-connected —and that's where the trouble developed. With the passage of time the pin-holes wore and it was found that the eye-bars were not taking the load equally.

Another important consideration was the increased weight and speed of locomotives in recent years. This, coupled with the flexible nature of the spans that became emphasized with the pin-hole wear, made it necessary to place speed restrictions on certain types of heavy locomotives. It ultimately led to the decision to renew the substandard portion of the bridge.

First step in the renewal procedure was to bulldoze a roadway for off-track equipment from the north end of the bridge down to the far end of the second truss span. The roadway was omitted under the third truss span, leaving a channel to carry diverted river flow at low water. A total of 195 piles were driven with an average length of 15 ft. below cut-off. Under the third truss span, additional piles were driven for falsework to carry the off-track equipment.

Two-story falsework

Posts of the falsework were made from round piles. The 8x17 in. stringers used throughout the falsework were second-hand, salvaged from trestle renewals.

After the girder span has been renewed with aid of a locomotive crane, first and second story falsework was placed under the first truss span, and first story falsework under the second truss span.

Erection of the falsework on the first truss span was completed in seven weeks. The floor system was then wedged up and removal of the old steel span was started. Torches were used in cutting it apart, since the bridge was not suitable for re-erection. Only the stringers and top chord members were salvaged for use in renewal of small bridges and culverts.

Because the cutting torches created a fire hazard to the timber falsework, a fire pump and hose system was installed. A watchman was assigned to the site at night when the bridge gang was not working and timber was kept wet down while cutting was in progress.

After the first old steel truss was cut apart and removed, the old floor sys-

FINAL STEP is the placing of new ties, replacing temporary deck installation.

tem rested on the falsework and became part of it, still of adequate strength to carry trains at reduced speed.

The new steel was erected in place by use of the locomotive crane, beginning with the new floor system and continuing with the main truss members. When trains approached, the main line was cleared, the locomotive crane returning to a spur track built at the south end of the bridge.

When the first truss span was completely bolted and pinned at the points it was swung free of the falsework. Part of the crew then riveted the points while another gang, using the locomotive crane, shifted the falsework to the second span, permitting completion of the lateral bracing of the first truss span. The same procedure was used at succeeding spans.

As soon as each span was swung off the falsework, placing of the open deck system began. The deck consists of treated Douglas fir ties with steel checkered-plate side-walk and handrails.

Total number of men employed on the project varied from time to time, but on an average there were about 45 on the job, of whom 15 were steel bridgemen. The new spans are designed for a Cooper E-72 loading, to handle the heaviest trains without speed restrictions for years to come.

The work was planned and executed by the maintenance of way department of the Southern Pacific Railroad. Bridge design is under the direction of J. J. P. Dunnagen, bridge engineer. E. E. Mayo is chief engineer.

Housekeeping Solves Small-Plant Stream Pollution Problem

Like many small manufacturing companies, the Elliott Co., of Jeannette, Pa., recently faced the problem of cleaning up its waste waters to avoid pollution of public streams.

Management discovered that by instituting plant-wide housekeeping improvements and by full use of existing equipment, they were able to achieve pollution abatement without a major outlay of funds or interruption of operating schedules.

The plant, which produces turbines, condensers, superchargers, centrifugal blowers and other plant and processing equipment, had to contend principally with several contaminants—soluble and lubricating oils, waste pickle liquor and rinse water, and cyaniding quench waters.

A survey conducted by Hall Laboratories, Pittsburgh consultants on industrial water problems, showed that although each contaminant would require individual treatment, careful planning and a modest expenditure would enable the company to meet its local good-citizenship requirements in preventing contamination of nearby Bushy Run, which receives the plant's two waste-water flows.

The survey also showed that one offender was soluble and lubricating oils, mainly from compressors, steam turbines and gear boxes of production machine tools, and spoiled coolants used by production and precision machine tools. These materials, it was found, were being permitted by shop workers to pass into floor drains leading to the plant sewers. Accordingly, drip receivers were installed, and the oily waste thus collected now is dumped on the coal stockpile. Another step was installation of a skim baffle on the spray pond and the shaping of an earthen basin at the sewer outfall to act as an oil trap in case of accidental oil spills. Finally, provision was made for separate collection of waste soluble oils and disposal of this material on the coal stockpile.

Waste pickle liquors are neutralized in the pickle tank by periodic addition of alkali, and sludge is disposed of in a lagoon on the plant property.

Oil tanks converted

Two underground oil storage tanks —no longer used because of a recent change in fuel—made possible economical disposal of rinse water. This water is now automatically neutralized during operation and piped to the tanks.

One tank has been adapted for sedimentation and withdrawal of neutralized rinse water through a swing pipe; the other tank is used for concentration and storage of sludge produced by neutralization of rinse water. Each morning the swing pipe skims off supernatant which then is disposed of in the plant sewer system.

Care in rinsing and segregation of cyanide rinse water, and separate disposal, proved to be a different problem but not costly or difficult. Previously, small parts of turbine generators were dipped in cyanide salt baths, and quenched with continual runover. When it was found that continuous overflow was contaminating the main body of the plant waste water, it was decided to switch from continuous rinse to batch rinse. This in turn made possible minimization and segregation of this noxious waste, with separate disposal.

Finally, it was determined that sodium dichromate, which was formerly employed to prevent corrosion in cooling water circuits, was having a toxic effect on the plant waste water. Accordingly, a non-toxic material—a special phosphate glass—was substituted.

Aeration Speeds Grit Removal

Nye Grant
Associate Member
Paul A. Uhlmann and Associates
Columbus, Ohio

An Aerated Grit Chamber believed to be the first large-scale installation of its kind was recently put into service at the Columbus, Ohio sewage treatment works. An essential element of the 43- to 80-mgd. expansion program, the new facility will eliminate the problem of inorganic settlement in succeeding treatment processes.

The main purpose of diffusing air during grit separation is to maintain sewage in rolling motion, at a velocity which will have just sufficient turbulence to keep organic solids in suspension but allow inorganic grit to settle. The composite motion of the air-induced roll and flow-through velocity is a longitudinal, helical roll (Fig. 1). The upward segment of the roll, plus the air, tends to keep light organic matter in suspension; the downward thrust encourages grit settlement. The horizontal motion along the floor washes heavy particles into a hopper under the diffusers and below the tank bottom where they are beyond the uplift influence of the roll.

Chamber located above plant

The grit chamber is located at Rennick Run—the junction of several storm and sanitary sewers above the treatment plant. This site was chosen because sediment in the 6,700-ft. Olentangy-Scioto outfall between the junction and the plant has often reduced plant capacity by as much as 50 percent. In addition, sticky grit accumulating in the suction well regularly clogged inlets to low-lift pumps, which preceded the original grit chamber. These persistent interruptions, which were eased by capacity-reducing, makeshift operating procedures, will be permanently eliminated by the new grit chamber.

Other advantages of the site are: Personnel from nearby pumping stations, outfall-control structures and the sewer-maintenance yard will be employed to operate the grit chamber on a 24-hr. basis; flood protection is provided by a levee surrounding the 3.5-acre service area.

The new grit chamber consists of a "cut-in" conduit from the outfall sewer to the grit chamber; a surge chamber on the cut-in conduit; entrance chamber; two screen channels; a screen-bypass channel; distribution conduit; four aerated grit-separation tanks; collection channel; a clam bucket suspended over the tanks from a bridge crane; and a control and service building.

The Olentangy-Scioto Intercepting Sewer is connected to the grit removal structure by a 10.5x6.5-ft. reinforced concrete conduit, 130 ft. long.

The surge chamber, or conduit, designed to dissipate translatory waves that will result from sudden closure of sluice gates leading from the entrance chamber, is connected to the cut-in conduit. The surge chamber is itself a conduit, 10.5x5.0-ft. in section, rising from the top of the intercepting sewer. It is connected above the crown of the Rennick Run storm outfall sewer through two 48-in. square flap gates. Surge waves having energies of more than 13-ft. of water column will rush through these gates and be discharged to the river.

The entrance chamber, fanning out from the inlet conduit, contains sluice gates for controlling flow to the screen and bypass channels. Gates to the screen and bypass channels are hydraulically and manually operated, respectively (Fig. 2).

Screen channels parallel to and ten feet on each side of the bypass, are curved with expanding sections to control distribution of velocity through the screens. Screens and channels are proportioned to accommodate average velocities ranging from 2.0 fps. at 80 mgd. to 3.0 fps. at 160 mgd.

Two power-driven, mechanically cleaned screens with one-inch clear openings are set vertically in the channels. Rakes move upward on the influent side. Collected debris is lifted to a water-flushed discharge trough, mechanically ground and returned to sewage flow.

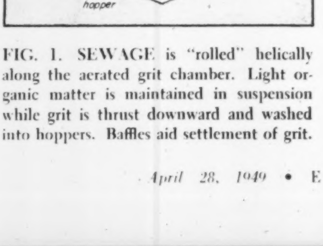


FIG. 1. SEWAGE is "rolled" helically along the aerated grit chamber. Light organic matter is maintained in suspension while grit is thrust downward and washed into hoppers. Baffles aid settlement of grit.

Although somewhat larger, the screens are similar to two units designed for the City of Columbus by S. J. Savage, consulting engineer, that have operated satisfactorily in the Columbus plant for six years.

Screen channels and the by-pass both discharge into a distribution chamber extending across the ends of those three channels. Stop-plank grooves in the outlets permit the channels to be shut off for repairs.

Flow from the distribution chamber into the four grit-removal chambers is through 48-in. dia. conduits that terminate in sluice gates operated by oil hydraulic cylinders. Clamping yokes on tell-tale rods prevent drifting when gates are partly open.

Air diffusers in grit chambers

The four grit chambers, designed as an adaptation of conventional aeration tanks, are divided into four compartments (Fig. 2). The exterior as well as interior longitudinal walls are Y-shaped with filleted bases to give form to the air-actuated sewage roll.

Transverse dividing baffles extend up from the floor (11 ft.) and slope downward across the top to a low point, five ft. above the floor, opposite the air diffusers. The sloped baffles facilitate interception of grit and passage of sewage and organic matter through the chambers.

Each compartment contains an inverted, truncated-pyramid grit-collection hopper directly under the air diffuser. All faces of the 97-cu.ft. hoppers are lined with 30-lb. imbedded rails to prevent damage to concrete during grit removal by clam bucket. Compartment floors slope 6-in. to hoppers.

A 3½-in. pipe header carrying five tube diffusers suspended two feet above each hopper, is connected to a 6-in. air main in the top of each Y-shaped wall by a knee-jointed 3½-in. riser assembly. Each bank contains five metallic tubes wound with nylon cord impregnated with synthetic resin. Both metal and cord are chemically resistant materials.

Diffuser banks can be swung out of

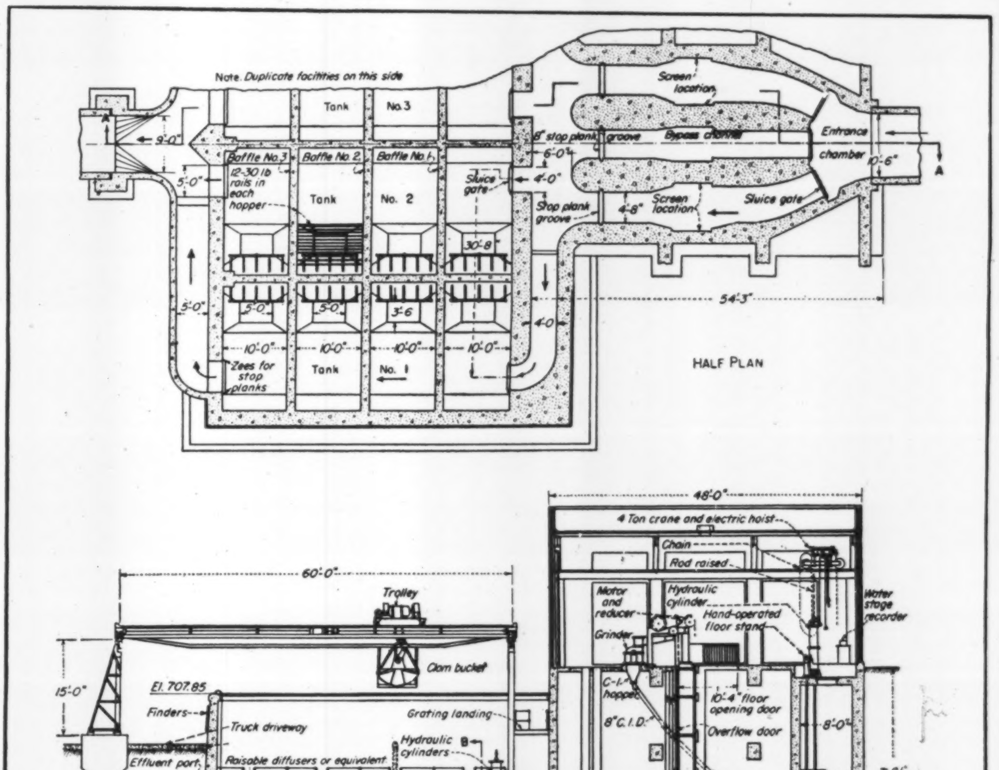

Note. Duplicate facilities on this side
Tank No. 3
A
9'-0"
5'-0"
Baffle No. 3
Baffle No. 2
Baffle No. 1
12-30 lb rails in each hopper
Tank No. 2
Sluice gate
30'-8"
5'-0"
5'-0"
5'-0"
3'-6
10'-0"
10'-0"
10'-0"
10'-0"
Zees for stop planks
Tank No. 1
8" stop plank groove
6'-0½"
4'-0"
Stop plank groove
4'-0
4'-8"
Screen location
Screen location
Bypass channel
Entrance chamber
Sluice gate
10'-6"
A
54'-3"
HALF PLAN
60'-0"
Trolley
Clam bucket
15'-0"
El. 707.85
Finders
Truck driveway
Grating landing
Hydraulic cylinders
B
Raisable diffusers or equivalent
Effluent port
El. 692.8
El. 688.60
W.L. @ 80 M.G.D. per tank
Sluice gate
9'-0"
W.L. @ 80 M.G.D. 686.15
Liner plates
5'-0"
2'-0"
10'-0
B
62'-9"
SECTION A-A
48'-0"
4 Ton crane and electric hoist
Chain
Rod raised
Motor and reducer
Hydraulic cylinder
Hand-operated floor stand
Water stage recorder
Grinder
C-I-hopper
8" C.I.D.
10'-4" floor opening door
Overflow door
8'-0½"
3'-8½"
Center sluice gate
West sluice gate
Screen
12'-2" long x 6'-6" wide
⅜" x 2" bars - 1" openings
83'-0"
Note: All tanks similar
Effluent port
W.L. 691.05 @ 40 M.G.D. per basin;
W.L. in O.S.I.S. 690.70
W.L. 690.35 @ 40 M.G.D. per basin
W.L. in O.S.I.S. 689.70
15'-0"
Tank No. 1
Zees for stop planks
Raisable diffuser
Tank No. 2
Tank No. 3
Diffuser (raised)
Crushed stone
Tank No. 4
2'-0"
4'-4"
6'-2"
3'-0"
45° bevel
2'-6"
W.L. @ 15 M.G.D. 688.20
13 toe pockets @ 15 c.c. in each tank
18" x 18" hole through each baffle
9 toe pockets @ 15" c.c. in each baffle
693
692
691
690
689
688
687
686
30-lb. rails in all sumps
SECTION B-B
0
5
10
15
20
Feet

FIG. 2. AERATED GRIT CHAMBER—Screened by mechanical units, raw sewage flows into four parallel chambers (half plan) where deposition of grit is aided by air diffusion (A-A). "Y"-shaped walls give form to air-induced roll. (B-B).

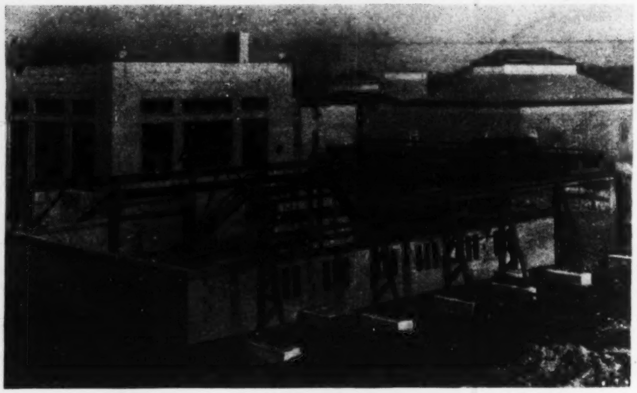


FIG. 3. SETTLED GRIT is picked up by clam bucket on bridge crane, and truck-transported to landfill. Trucks will operate on paved runway to be built between wall and triangular towers in right foreground.

the tanks to a position over the Y-shaped walkways by use of a compressed-air hydraulic hoist, when grit is to be removed from hoppers by clam bucket or when inspection and repair are required.

Air supply

The banks of five diffuser tubes can supply air at the maximum rate of four cfm. per foot of tank length. Tests indicate that the maximum velocity of roll is more than 2.0 fps. when air is delivered at this rate.

Air is supplied by two positive-displacement blowers connected through vari-drive transmissions to electric motors. Total blower capacity is 500 cfm. at 7½ lb. pressure.

Adjustable blower speeds permit variation in the air-induced velocity of roll from zero to 2.0 fps. but the velocity generally will be maintained near 1.0 fps. to remove grit retained on a 65-mesh sieve.

With four tanks in operation, flow-through velocities and detention periods are, respectively: Eight fpm. for five min. at 80 mgd. and 16 fpm. (0.27 fps.) for 2.5 min. at 160 mgd.

Effluent passes from grit chambers over fixed-elevation weirs, 5 ft. wide, into a collection channel extending across the ends of the four tanks. Weirs, located at the opposite end of the tank from the inlet sluice gates, are fitted with vertical "Z" bars for insertion of stop planks. Outflow is to the center into a 9-ft. dia. connection to the existing Olentangy-Scioto outfall.

The entrance chamber, screen and bypass channels, distribution conduit, grit chambers and collection channel are built of reinforced concrete. Transition sections and changes of direction are made with smooth-flowing curves to minimize hydraulic losses as well as turbulence.

To preclude flooding of the levee-inclosed area through the grit chamber, the top of the tank walls are 2.5 ft. above the probable 50-year maximum river stage. This precaution was taken even though the interceptors are protected by flood gates.

Clam bucket grit removal

Grit is picked up from tank-bottom hoppers by a one-half-yard clam bucket suspended from a bridge crane with a 60-ft. span over the tanks. Because the bridge is parallel to the line of hoppers, only the trolley moves during cleaning. The operator's cage is sus-

DESIGN AND ENGINEERING DATA FOR THE AERATED GRIT CHAMBER AT COLUMBUS, O.

Sewage Characteristics: Domestic sewage plus industrial wastes; heavy-storm flows as well as grit loads received at plant because of partial combined system; suspended solids and BOD average 250 and 220 ppm., respectively.

Interceptor Connection: Inlet—10.5 x 6.5 ft., 130 ft. long; outlet—9.0-ft dia., 200 ft. long; reinforced concrete; 160 mgd. maximum capacity.

Surge Outlet Chamber: 10.5 x 5.0 x 33.5 ft. reinforced concrete; two 48-in. flap gates; discharge to river through storm sewer connection.

Entrance Chamber: 10.5-ft. inlet; fan-shaped; 6 to 9 ft. water-depth range; 54 x 72-in. sluice gates to two screen channels and bypass, hydraulically and manually operated, respectively.

Screen Channels: Two conduits with curved expanding sections to screens. Average velocity range—2.0 to 3.0 fps. at 80 and 160 mgd., respectively; Power-driven, mechanically cleaned screens with one-inch clear openings in each channel; screenings ground and returned to sewage flow; Stop-plank grooves at outlets of channels.

Bypass: Midway between screen channel. Stop-plank grooves at outlet.

Distribution Conduit: Four ft. wide; extends across grit chamber; 48-in. outlets to grit-removal tanks.

Grit Chamber: Four tanks, 43.75 x 19.75 ft. with 13.0 ft. water depth; 48-in. oil-pressure actuated inlet sluice gates; reinforced-concrete baffles sloped from 11-ft. to 5 ft. height; air diffusion through banks of five metallic tubes wound with chemically resistant cord; mechanism and knee-joint piping for raising banks of tubes for inspection and replacement; tank bottoms sloped 6-in. to hoppers; hoppers protected with imbedded 30-lb. rails; 5-ft. fixed outlet weirs with vertical Z-bars for stop planks.

Collection Conduit: 5-ft. wide, 8.4 ft. deep at ends; 11.2 ft. deep at center; covered with reinforced concrete slab discharges at center to 9-ft. dia. outfall.

Grit Removal: One-half-yard clam bucket on 3-ton, 60-ft. span bridge crane with operator's cab; grit discharged to trucks on paved driveway just south of tanks; grit disposal as land fill.

Air Supply: Two positive-displacement blowers; vari-drive transmissions to electric motors; total capacity—500 cfm.

Control and Service Building: Two sections—a 43 x 46-ft. control room with 20 ft. ceiling height for screens and sluice gates, and a two-story annex for electrical and heating equipment as well as garage space; unit heaters; exterior flood-lighting for cleaning grit at night; glass-block windows.

pended from the trolley so that the bucket can be spotted quickly at all times.

The clam bucket empties into dump trucks under the south end of the crane. Trucks operate on a 14-ft. paved driveway, built just outside of the tanks.

The control and service building is divided into two sections: A screen- and gate-operating room and a two-floor unit for service equipment. Electrical switch-gear, blowers and hydraulic-accumulator accessories are housed on the upper floor; the heating plant and garage occupy the lower level. The lower level is at grade while operating and equipment floors are 12 ft. above.

Exterior walls of the control and service building are of light buff hard-glazed brick, topped with precast concrete coping. The brick work has three recessed bands at the outer corners and across the top of each wall face. This banding acts as a frame to accentuate the large glass block areas and windows. Auxiliary ventilation is provided by a horizontal band of transparent glass windows.

Preliminary studies

Hydraulic design was restricted because the grit-removal units had to be connected into the Olentangy-Scioto interceptor so that no more than 1.0-ft. head loss would result. Interceptor capacity at the cut-in point is 160 mgd. without surcharging and the units were designed to operate with a 0.6-ft. head loss at this point. This loss will produce surcharging for a 300-ft. distance back to a change in section from 10.5-ft. wide by 5.5-ft. high rectangular to 9.0-ft. dia. circular. For the rectangular section the invert and roof are 4.22 and 0.72 ft. higher than the invert and crown of the circular sewer, respectively. Surcharging, therefore, will not extend beyond the transition section.

First designs embodied a battery of eight conventional grit channels with trapezoidal sections and conveyor-type grit collectors. It was found, however, that sewage-level fluctuations in the interceptor due to automatic operation of the main sewage pumps would have created unstable operating conditions in the tanks. In addition, the battery would have been about 125x60 ft. in plan compared to the 83x43.75-ft. design selected. With wall height about the same for each design, a saving of about 40 percent in reinforced concrete was realized with the aerated chamber. Screen chambers and operating building would have been substantially alike for both cases.

As a result of the preliminary investigation and study, it is concluded that the aerated grit-removal system for conditions at Columbus, Ohio has several advantages. Among these are: (1) Lower first cost than conventional grit channels; (2) Grit particles that enter the tanks at the top of the sewage will be carried down with the roll; (3) Variations in depth due to downstream conditions will not appreciably affect the velocity of flow (roll) so that uniformly clean grit will be settled out; (4) Velocity of roll can be easily adjusted independent of quantity of sewage passing through the tanks; and (5) Some dissolved oxygen will be added to the usually stale sewage, which will act to inhibit septicity.

The Bass Engineering and Construction Co. of Birmingham, Mich. is the general contractor for the grit-chamber project. Contractor's personnel are: O. A. McFarlane, superintendent, and Gene Johnson, engineer. The swing diffusers were manufactured by the Chicago Pump Co., Chicago, Ill.

The project was built by the City of Columbus, Ohio under the supervision of Elmer A. Keller, director of public service; James H. Blodgett, superintendent of sewage treatment; and Paul A. Uhlmann and Associates, consulting engineers.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill)

Loss of Profits

The recent case of Haddad v. Western Contracting Co.,[1] contains an interesting discussion as to the right to recover prospective profits as an element of damage from breach of contract. The action was brought by a subcontractor, against the general contractor, to recover damages for breach of contract, the subcontractor claiming that after he had performed part of the work he was justified in abandoning it by reason of certain acts of the general contractor that constituted a breach of contract. The subcontractor obtained a verdict which included an allowance for loss of prospective profits.

The only evidence offered by the subcontractor as to prospective profits was that he was an experienced contractor and that taking various factors into consideration, he estimated that his profit on the job would have been $27,000. The court set the verdict aside and ordered a new trial indicating that a mere opinion of estimated profit was not sufficient to sustain the verdict and that facts upon which the opinion was based should be presented.

The court in its opinion stated: "There can be no doubt as to the right of plaintiff to recover profits in a case of this kind. But here plaintiff sought to establish the amount of his loss by his opinion of his profits, without giving the facts on which such opinion was founded. This is not a case where plaintiff can establish his profits by the opinion of witnesses, even though they be experts. To hold otherwise would transfer to such witnesses the function and duty of the jury who are alone given the power of reaching conclusions from given premises. It would make the rights of the parties dependent upon the conjectured and speculative opinion of witnesses, many of whom would not agree."

In a more recent case[2], it was held that the difference between the contract price and the cost of performance would have constituted lost profits. The court, in this case, cited with approval the above case of Haddad v. Western Contracting Co. The cost of performing the work can be shown by expert testimony.

In Penn Foundry & Mfg. Co. v. United States,[3] the court allowed 4 percent of the gross contract price as damages in an action for breach of contract.

"In a contractor's action for loss of profits through not being permitted to complete performance of his contract, allowance should be made in ascertaining the damages recoverable, of a reasonable amount for release from care, trouble, risk, and responsibility which would have attended the full execution of the contract." [4]

The law places upon the contractor the burden of proving the extent of his damages. These facts are better known and can be more readily proven by the contractor than by the person for whom the work is being done.[5]

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(1) Haddad v. Western Contracting Co. 76F. Supp. 987.

(2) United States v. Purcell Envelope Co. 249 U. S. 313, 63 L. Ed. 620.

(3) Penn Foundry & Manufacturing Co. v. United States, 75 F. Supp. 319. (Court of Claims).

(4) Mays v. Hartman, 77 N.E. 2d 93. (Court of Appeals of Ohio).

(5) Molyneux v. Twin Falls Canal Co., 35 P. 2d 651.

FIRE RUSHES UP FUSE to ignite charges placed along the center line of the roof, as . . .

Giant Timber Airship Hangar Felled by Half Ton of Dynamite

By Samuel Hymon
Chief Engineer, Cleveland Wrecking Co., Cincinnati, Ohio

In a bold and dramatic departure from conventional methods of the demolition industry, the Cleveland Wrecking Co. recently tore down a huge wartime timber blimp hangar by dynamiting.

Within a few seconds after the detonation of a half-ton of explosives in three successive charges, most of the structure lay on the ground. And the contractor expects to salvage 70 percent of the material.

This hangar, at Houma, La., was one of several built by the Navy during World War II at continental lighter-than-air stations (ENR Oct. 22, 1942, p. 110). It embodied a daring design that excited the imagination of the naval civil engineers. The structure measured 300 ft. in width, 1,000 ft. in length, and 170 ft. in height. Built entirely of wood, its open floor area was made possible by 51 arched parabolic trusses that measured 13½ ft. in depth, with the top and bottom chords built up of doubled 4x14's at the base and 3x14's at the top. Cross members varied from double 4x12's to 4x8's. These were braced laterally with doubled 3x8's and doubled 3x6's. All connections were made with timber rings and bolts. The entire exterior surface of the hangar was sheated with 2x8 tongue and groove lumber. Most of the lumber used throughout the structure was No. 1 dense structural grade yellow pine. All wood in the structure was made fire resistant.

The doors were constructed in the shape of quarter spheres. These were opened by electrically powered dollies which drove the doors out of the way on semi-circular tracks. Current came from a 75-kw. generator activated by a 120-hp. diesel at each end of the hangar. Ingeniously designed and braced with a multiplicity of timber ring connections, bolts and structural steel, angle and channel braces, the doors themselves weighed 600 tons apiece.

Heavy maintenance cost

The Houma hangar was designed to operate for a limited period of time. Because it had served its purpose, and to save maintenance cost, it was decided to demolish the hangar and release the materials for civilian use. There were 3,000,000 ft. of lumber in the structure and in addition there were hundreds of thousands of feet of lumber that had been used for falsework during erection. The building housed six of the Navy's helium-inflated lighter-than-air ships.

Upon the award of the contract, the contractor considered a number of plans for demolition. One of the methods suggested was the use of a template of falsework from which the material in the hangar could be removed piece by piece. Although this would have resulted in the salvage of almost 100 percent of all lumber, the idea was rejected because of excessive cost. Various other methods were contemplated, by which each truss or pair of trusses could be felled and later dismantled on the ground. These methods were abandoned as impractical due to the possibility of the trusses failing under their own weight, if robbed of the assistance of the cross bracing and the sheathing on the exterior.

It was finally decided to consider the possibility of collapsing the hanger by means of explosives. Research was made into the various types of explosives and the application to the shearing of wood timbers. Because of its immediate availability, dynamite was finally decided upon. A small model of the hangar was built and experiments were conducted in order to determine the safest method of dropping the various sections of the building and to obtain the least destruction of the salvaged materials.

The demolition job

Once the method was decided, preliminary work got under way. The first job was to remove equipment from leantos at the abutments, and to tear down the leantos. Facilities in these marginal spaces included large compressors, dope rooms, spray rooms, transformers, heavy electric equipment, and two boilers that had heated the building through unit-blower type heaters.

Then the contractor felled the quarter-spherical doors. About 200 lb. of dynamite, totaling 400 sticks, were required for this job. The doors were opened and swung around to a point

700 ft. from the building, dropped perfectly on their flat sides and later dismantled piece by piece. Seventy percent of salvaged material was obtained from the doors.

Dropping the hangar

The first illustration here shows an aerial view of the hangar as it appeared before demolition operations were begun. The doors are partially open. The drawing indicates the location of charges and the succession of firing. The first shot dislodged the monitor throughout; the second detached the right hand half of the shell from the abutments; and the third broke the left half off. The objective was to drop the monitor to the deck, then fold the right half under the left to bring it on top of the monitor.

Half-sticks of dynamite were taped on all three members of each truss, slightly to the left of the centerline at the top of the hangar. To the right of the centerline, additional charges were placed at the top chord only. At the abutments, dynamite charges were taped to the outer chord and the main diagonal. In all, 1,960 half-pound sticks were used.

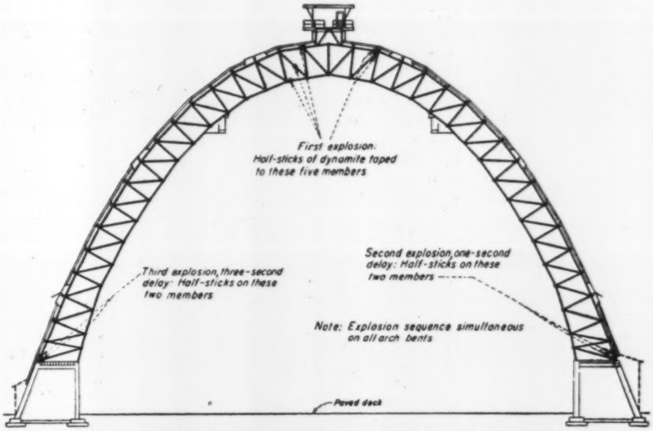
It was planned to detonate these charges with one-second delay between the first and second, and about two additional seconds between the second and third. The first charge dropped the monitor, and immediately thereafter the second charge severed the right half of the building. The weight of the monitor (not yet completely broken off) pulled the right half of the building upon it. As soon as the right wall began to fall, charge No. 3 was detonated, causing the right half to fall on top.

The last photo shows the result. The structure fell almost precisely as planned. To cushion the fall of the building, roof sheathing was left in place, thus providing air resistance to the acceleration of gravity as the pieces fell.

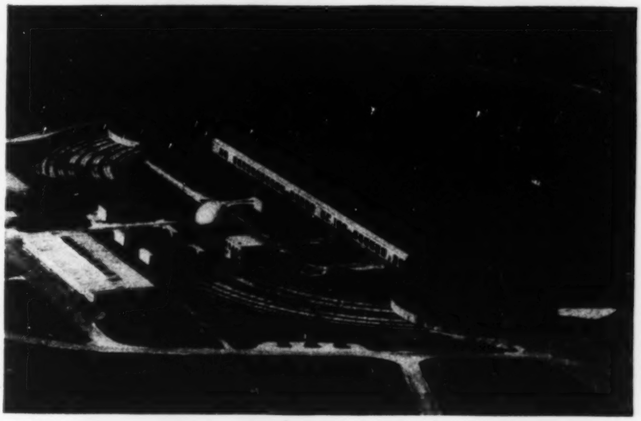
Some buckling took place, but not of any serious consequence. Buildings within 50 to 100 ft. of the base of the hangar were not touched. The few members remaining standing were pulled down with a crane and cable. The heavy concrete abutment bents, according to the terms of the contract, were to be left undamaged; there was no indication of any damage to the concrete.

It is estimated that about 70 percent of the timber will be salvagable for re-use.

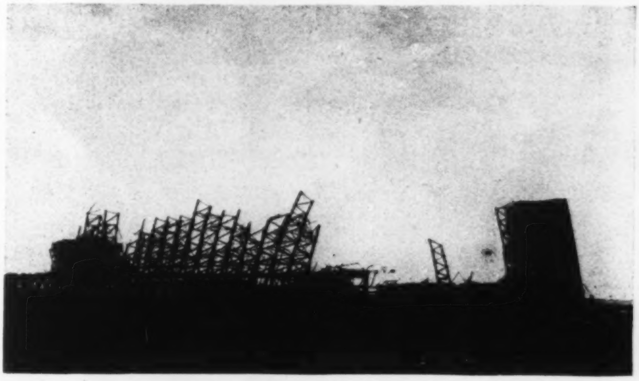
Arthur Caya is superintendent in charge of the project for the Cleveland Wrecking Co.


First explosion:
Half-sticks of dynamite taped to these five members
Second explosion, one-second delay: Half-sticks on these two members
Third explosion, three-second delay: Half-sticks on these two members
Note: Explosion sequence simultaneous on all arch bents
Paved deck

DEMOLITION PLAN prepared by contractor before he reduced this . . .



DOOMED BLIMP HANGAR at Houma, La., to . . .



TIMBER FOR SALVAGE, in a few seconds' time.

Cone Valve in Tremie Pipe Facilitates Placing Concrete

A SIMPLE CONE VALVE at the bottom of a tremie pipe facilitated placing of a concrete seal in the cofferdam for a new screen well at the Riverside power station of the Savannah Electric Power Co., Savannah, Ga.

The screen well was built integral with a steel sheetpile bulkhead that was constructed along the existing harbor line on the south bank of the Savannah River. Due to the nature of the subsoil, a tremie concrete seal was required for the cofferdam for the well, which was of deep section steel sheetpiles.

Normal high tide at the power station is +9.0 ft. and the bottom of the seal is at −13.5 ft.

After the cofferdam had been driven, 77 wood piles were driven inside it to support the screen-well structure and then a clam-shell bucket was used to excavate to −16.5. A diver then examined the bottom and after a few days had been allowed to elapse to permit the silt to settle, the bottom was pumped out to remove the silt. A high-pressure jet was used to agitate the silt during pumping.

When the silt had been cleared, a layer of very coarse clean sand was spread over the bottom in advance of placing the seal.

Concrete for the seal was a 6.8-bag mix in which the water-cement ratio was controlled to produce a 5½-in. slump. For placing the concrete, the cone valve was closed and the pipe was filled to a depth of 4 to 6 ft. before lowering it into the water. This kept the pipe from filling with water and eliminated all segregation due to that cause. Subsequently, the pipe was kept filled at all times and moved about slowly to get a uniform depth.

As the rate of flow of concrete into the bottom could be controlled at all times, a very uniform spread was obtained. The surface of the mat did not vary more than three inches from the desired grade at any point.

As will be seen in the accompanying drawing, the valve for the end of the tremie pipe consisted of a cone made out of ¼-in. plate with a transverse bar welded across the bottom in vertical position. The top of the cone was cut off to create a 1-in. hole through which the supporting cable was passed and fastened to the transverse bar.

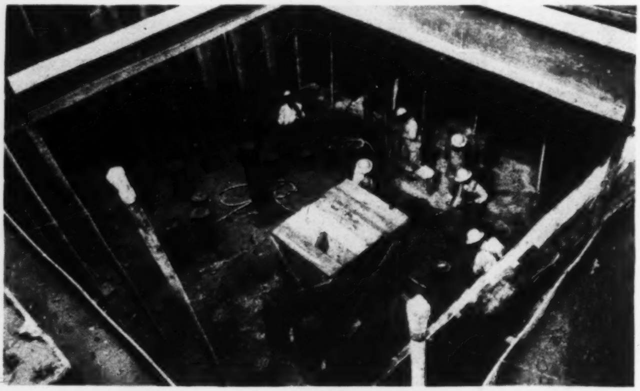
An important element of the design was the arrangement at the top of the hopper for limiting the opening of the cone valve by means of a clamp on the operating cable that seated on a pair of angle irons across the top of the hopper.

This tremie and valve cost $198, including labor, materials and overhead. The cost of the concrete mat, including the tremie, labor, material, and overhead came to $26.17 per cu.yd. A total of 84 cu.yd. of concrete was placed in 6½ hours.

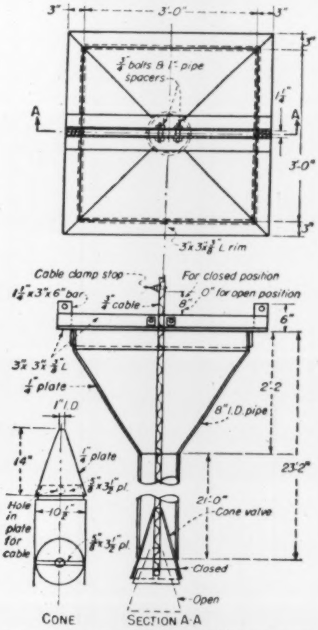
The work was done by the Stone & Webster Engineering Corp. through its Tampa office, of which B. W. Sprague is superintendent. N. R. MacPhee was assistant superintendent on the job, M. W. Wasson, Jr., resident engineer, and Stanley Cookson in charge of concrete work.

Stop to control
valve opening

THE TREMIE PIPE was hung from a crane boom with the cable attached to the cone valve hooked into the same shackle that supported the chain falls used to raise the tremie's pipe to open the valve. Lower view shows the valve open.



UNWATERED SCREENWELL COFFERDAM showing the tremie concrete seal. The pipes around the outside were connected to well-points that were installed to permit reducing pressure under the mat in case it was not watertight.



DETAILS OF THE TREMIE and cone valve. The hopper had a volume slightly greater than the pipe.

READER COMMENT

Algae in Warm Water Wells

Sir: The "heat pump" article (ENR Feb. 3, p. 65) brings to mind an experience with wells in an air conditioning installation for Sears, Roebuck and Co. in Los Angeles. This installation has been functioning with entire success for quite a number of years. Originally, it was anticipated that the warm water—delivered to the disposal well—would cause serious algae growth. It was planned to switch the submersible pump from the "origin" well to the "disposal" well—if this problem developed.

We do not know all of the answers to the success to date—as no algae growth and no clogging have developed in the disposal well. Some of the assumptions may include: Little or no light to encourage growth; unusually pure water; quick dissipation of heat because of relatively low temperature of adjoining water; etc.

W. N. Beadle
Vice President, Byron Jackson Co.
Los Angeles, Calif.

Army Engineers' Civil Work

Sir: In the Mar. 24 issue of Engineering News Record, an editorial discusses the plan of the Hoover commission to transfer the civil activities from the Army Corps of Engineers to the Department of Interior.

In another trade journal of the same date, there appears the following: "The aggregates industries in recent months have been greatly concerned by the aggregates requirements as set forth by the U.S. Corps of Engineers for large concrete structures. There have been many rejections and changes in specifications during the progress of filling contracts."

As we all know, there are some excellent men in the Corps of Engineers. We, also, know that there are some excellent engineers who have never been remotely connected with that body.

It is a fact beyond the question of a doubt that the Corps of Engineers has condemned crushed stone from certain quarries that have for more than a quarter of a century had their stone meet the test of time. This, of course, increases considerably the cost to the taxpayers to secure stone from some remote location. It is probably true that aggregates made of crushed stainless steel would make better concrete than a lot of crushed stone; however, a real engineer is one who can utilize available materials and produce a workable and satisfactory result.

It is entirely possible that the civilian work of the Corps of Engineers should be turned over to some agency that would have engineers who would have in mind the cost of structures, as well as the utility and permanence of same.

I am not remotely connected with or interested in any quarry operations.

J. Roy Pennell
President, Pennell & Harley, Inc.
Construction Engineers
Spartanburg, S. C.

Widened Interests

Sir: May I compliment your organization for the timely and generally excellent editorials that appear in Engineering News-Record. I am noting particularly the editorials on page 43 of the February 17, 1949, issue.

I have one question, however, on the editorial "Widened Interests." It is apparent that your editors appreciate the trend toward a broadened social concept of the engineering profession, especially among the leaders of the profession, but in the concluding sentence did not the editor intend to imply something like the following:

"It is well then that engineers should be reminded that their *own particular* works can be assisted by the knowledge available in *what may at first appear to be* quite unrelated fields *but which are really related fields of endeavor in the public economy and should be correlated.*" (Italicized part added).

Wilbur H. Simonson
Chief, Roadside Section
Public Roads Administration
Washington 25, D. C.

Vibration in Thin Dams

Sir: Having devoted a large part of my time for 22 years to study and design of arch dams, I would like to present the following comment on vibration discussed in your editorial (ENR Nov. 25, 1948, p. 37 and Feb. 17, 1949, p. 80).

The concrete arch dam on the Yuba River (Calif.) at Bullard's Bar has a height of 165 ft. For the express purpose of examining it under load, I made a trip to this dam at a time when it was being overtopped to a depth of 16 ft. by a flood of some 70,000 sec.-ft. I was unable to detect evidence of any vibration.

This observation checks findings of Lydik S. Jacobsen who used electric oscillographs and two-stage amplifiers to study the records obtained from 51 Carlson strainmeters which were embedded in the Englebright Dam (Upper Narrows, Yuba River) to determine vibrational effect on stresses in the dam. Although the height of fall at this dam is 257 ft. (maximum flood 84,000 sec.-ft. which gave a depth over the spillway of 11.4 ft.), Jacobsen's findings were that the "dynamic stresses in the dam due to water spilling over are negligible."

He also found that vibrational loading is one of the smallest of the factors making up the stresses in the dam. He reports: "The strain fluctuations in the dam were extremely small, probably less than $\pm 10^{-6}$ in. per inch or, in terms of stress, ± 6 psi. The records of the five workable joint meters are also steady, indicating that the dynamic displacement across the joints must have been extremely small."

After 4 years of overflow, the high fall at Englebright Dam has had no effect on the hard, quartz diorite in the channel, though some blocky rock was moved (and the zone was blanketed with concrete) where the dam crosses an old fault.

G. E. Goodall
Sacramento, Calif.

Too Many Student Chapters?

Sirs: Your editorial questioning the advisability of organizing more student chapters on the campuses of the engineering schools should be considered seriously by any organization planning such a move.

When I attended college all the engineering students were organized in one group. It was one of the strongest student organizations on the campus. Now we have divided the engineering students into their specialty groups and have no way to register engineering opinion as a whole. However, the student chapters of the Founder Societies are here to stay, and they can be improved if they receive more and more attention from the parent societies.

Possibly the NSPE could accomplish more by sponsoring cooperation between the chapters now organized—say on a basis similar to the EJC in the profession.

Dewey M. McCain
Head, Department of Civil Engineering
Mississippi State College

FIELD AND OFFICE

CONCRETE HIGHWAY POSTS – More than 1,600 concrete posts, each weighing 400 lb. and connected by steel guardrails, will line the top of South Dam of the Columbia Basin Project near Coulee City, Wash. Sparling Steel Co., of Seattle and Spokane, contractors, developed the pin-connected, welded-steel pipe spacers used for placing the posts on 12½-ft. centers, and U-shaped lifting device for handling posts.

Truck-Mounted A frame Utilizes Junk Parts

An "A" frame for mounting on a dump truck and ideal for handling cast-iron water pipe or large sewer pipe was developed by the Altavista, Va., public works office from salvaged rail and an old hand-winch.

A piece of heavy iron was secured across the front bumper of the truck, and to it were welded two U-shaped keepers. Two light rails made up the "A" frame itself, with a pulley at the apex and each rail bolted to a "U" on the bumper. (Two pieces of 2-in. pipe about 12 ft. long can also be used for the frame).

The hand-operated winch was mounted in the truck body just behind the cab—the forward pull makes only two bolts necessary.

Guides for the frame were made of small cable, both guys fastening at the pulley. To get the guys high enough to permit doors to be opened, a triangular brace was mounted vertically on each side of the dump body, in front, where the sideboard extension would be placed. A slot cut in the triangular braces, coupled with a small log chain, regulate the height of the boom, by permitting the log-chain to be attached to the lot at any desired height.

The front-mounted rig makes it easier for the driver to see, and allows long reach over ditch excavation.—T. B. NOLAND, City Manager, Altavista, Va.

Backing Bulldozer Rips Pavement With Hinged Teeth on Blade

Scarifying teeth mounted on a bulldozer blade effectively ripped old black-top pavement on a recent southern California road job. L. W. Flint, Los Angeles contractor, used an Allis-Chalmers HD-7 tractor that was so equipped for this particular road rehabilitation job. The teeth, known as "back-rib scarifiers," are hinged so they ride free on the forward stroke, but make an effective digging device on the reverse stroke of the tractor. When not needed, the ripping teeth can be set in an out-of-the-way position that permits normal use of the bulldozer blade (see photos below).

The 1¼x4-in. shaft of the teeth is designed to resist the forces encountered in such work.

It is understood that other size scarifiers are available for other makes and sizes of tractor from Small Equipment Co., 405 So. Orange Grove Ave., Los Angeles, Calif.

SCARIFYING TEETH on a bulldozer blade . . .

. . . **RIP PAVEMENT** on the tractor's reverse stroke

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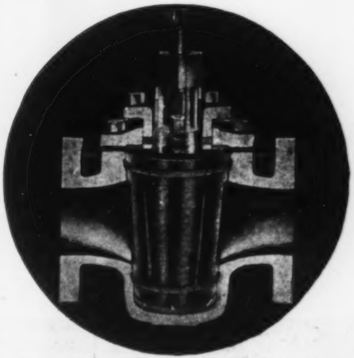

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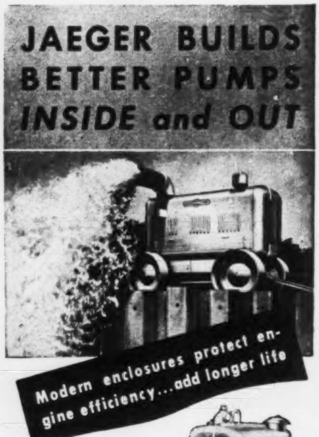
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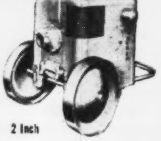

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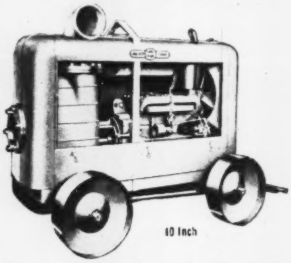

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UNIT PRICES BID BY CONTRACTORS

Unit price reports, listed below, will be mailed to readers of Engineering News-Record on request at no charge. Address Manager, Business News Department, Engineering News-Record, 330 W. 42 St., New York 18, N. Y. Identify by name of project as used herewith, and be sure to give full mailing address.

Tunnel, California

Bids on 33,000-ft. Tecolote Tunnel, on the Santa Barbara project, near Santa Barbara, Calif., were taken from six contractors on March 10. On March 30, the owner, U. S. Bureau of Reclamation, announced the rejection of all bids, with plans for readvertisement indefinite. Generally 7 ft. dia., the tunnel is to have a gate chamber and 125-ft. control shaft 800 ft. from one portal. Ground conditions in tunnel unknown. Low bidder (Wunderlich Contracting Co., Omaha) unit-priced 73,300 c.y. of tunnel excavation, all classes, at $54.00. Tunnel-lining concrete, 20,480 c.y. at $30.00 Thirty-nine items in all. Total of low bid: $5,482,865. High was $8,932,660.

Sewage Treatment Plant, New York

Enlargement of Ley Creek Treatment Plant, in Town of Salina, (Onondaga County, N. Y., owner) brought forth three general-contract bids ranging from $1,685,993 to $2,219,024. (18-month contract awarded to low bidders, Candler and Bass, Inc., Birmingham, Mich., Feb. 24, 1949).

New total capacities of this activated sludge plant will be: Secondary treatment, 9 mgd.; primary treatment, 20 mgd.; screening, chlorination and pumping, 40 mgd. Site, quicksand overlying black sand aquifer, about 14 ft. below grade. Ground water about 2 ft. below grade. Plant to be kept in operation during construction, which means some work will be on 24-hr., 7-day basis. Transports: Rail, half mile away; highway, at site; barge canal terminal five miles away.

Among 39 unit prices (79 items) are the following: General excavation, 39,500 c.y. at $3.15; class A concrete, 4,000 c. y. at $50.00.; timber piles, 75,000 l.f., at $1.00. Holmes, O'Brien and Gere, consulting engineers.

Earth dam, Pennsylvania

Another project on which bids (all of them in this case) beat the engineers' estimate is little Pine Creek Dam, in northern central Pennsylvania. This is an earth dam, for flood control and recreation, owned by the Pennsylvania Department of Forests and Waters. Lycoming Construction Co., Williamsport, got the 21-month job Feb 16, for $2,030,800. High of five bids was $2,289,001, and the estimate, last fall, was $2,500,000.

Dam length is 1,100 ft., height 115 ft. Concrete spillway is 300 ft. wide and 15 ft. deep. There is a highway at the site, and a railroad four miles away. Labor rate range: $1.00-$1.95. Of 47 unit-price items, the following are among the more significant: Earth excavation from spillway and forebay, 686,600 c.y. at $0.47; concrete, outlet conduit, 5,135 c.y. at $33.00; rolled embankment, from borrow, 150,900 c.y., at $0.52. Gannett Fleming Corddry and Carpenter, Harrisburg, is the consultant.

Outlet and interceptor Sewer, Ontario

Unit prices on Canadian work recently were sent to ENGINEERING NEWS-RECORD. The project, consist- of two main sections and 49 drain connections, all for the city of St. Thomas, Ont., is being performed by two contractors, at a total of about $150,000. Section I, consisting of 4,600 ft. of 18- to 30-in. concrete pipe running in cuts averaging 5 ft. deep, was awarded to W. B. Bennett, Oshawa, Ont., at $59,375, plus $5,890 for the drains. Section II, consisting of 4,200 ft. of 21- to 27-in. pipe in cuts up to 22 ft., went to A. E. Rule, Ltd., Toronto, for $76,613. Labor: Unskilled, 80¢; skilled, to $1.50. Awarded Oct. 20, 1948, to be complete Mar. 31, 1949.

Water Mains, Wisconsin

The prices for this Milwaukee project, which includes 2,635 ft. of 12-in. water pipe and 2,070 ft. of 42-inch, ran about 5 percent below estimate. This under-run is typical of the prices on current jobs in that city. Tomaro, Carle and Masini, Cudahy, Wis., got the 60-day job March 10 for 76,496. Prices for the two items mentioned were $7.50 per ft. and $17.50, respectively. There are 47 items. All pipe is laid 6.5 ft. to center below grade. Ground, clay and sand; backfill, bank-run sand or gravel; pavement above 42-in. pipe to be removed but not replaced; city furnishes all materials at site, except lead. Top price of five: $88,582.

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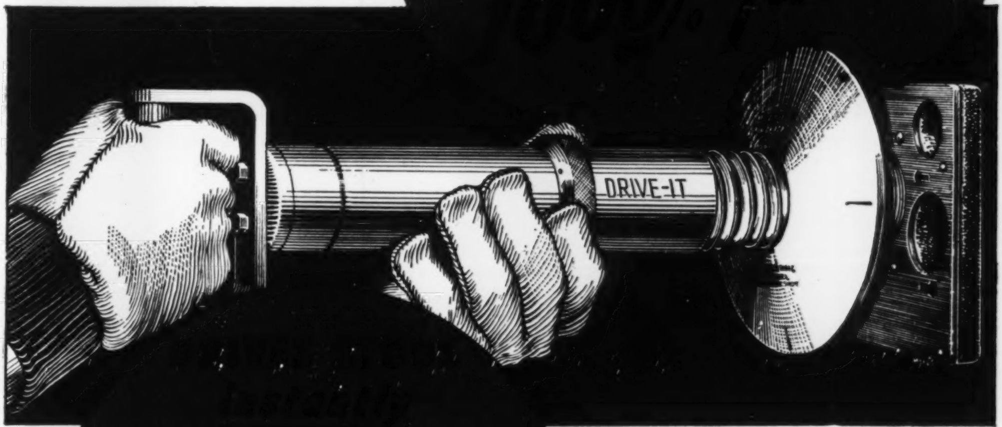

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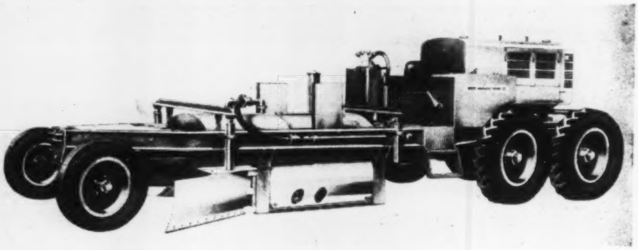

Self-Propelled Roadmixer

A new-model self-propelled roadmix machine is being added to the line of Wood roadmixers to meet the demand for a larger, self-propelled, rubber mounted traveling mixing plant. Features of the new model include: A power unit of 100 hp., tandem drive, five working speeds ranging from 9.2 to 55 ft. per minute, road speeds from 1½ to 11 miles per hour, one man operated, larger mixing drum, increased production, hydraulic controls, metered control of liquid binders. This model 42 Wood Roadmixer will mix in one pass all types of aggregates or soil with any type of liquid binder or stabilizing material used in the construction of mixed-in-place surfacing for highway pavements and also for base courses.—Wood Mfg. Co., 6900 Tujunga Ave., No. Hollywood, Calif.

Ventilating Tubing

Airtube is a heavy duty fabric ventilation tubing. Without wire reinforcement, it provides a low cost, quickly installed, flexible air duct for positive pressure systems. The couplings of this tubing permit interchangeability with Spiratube-M or standard Spiratube for bends or curves. The latter are made by spirally stitching fabric around a helical spring steel core, giving added strength to the tubing for use on both vacuum and pressure applications.—Flexible Tubing Corp., Branford, Conn.

Slide Rule Watch

"Arithmo," the Juvenia calculating wrist watch, has an accurate precision slide rule built around the dial. On turning the rim (corresponding to the slide scale) into which the watch crystal is set, the hairline, etched on an unbreakable annular glass ring, also rotates. When the hairline reaches the new position, it stops, even though the rim goes on revolving. The hairline starts again in the opposite direction as soon as the rim is turned the other way. Clockwise and counter-clockwise log scales are fixed beneath the hairline ring. All figures to be read are always in their normal position and all results are found in the same place. It is made with a fine 17-jewel Swiss movement, hence it is not a toy.—Georg Jensen, 667 Fifth Ave., New York, N. Y.

Low Slump Concrete Bucket

Manufactured in sizes of 2, 3, 4, and 8 cu.yd., new "Lo-Slump" concrete bucket, designed for heavy-duty requirements on big dam construction, discharges mass concrete with cement content as low as two bags per cubic yard and slumps down to ½ in. using 6-in. aggregate. Bucket deposits these mixes without segregation. Extra large discharge opening is controlled by double clam discharge gate that can be operated manually or by compressed air. For easy hooking, hinged bail link always stands vertically and is slotted to give it considerable vertical hooking range. Bottom slopes of bucket above short cylindrical discharge section are approximately 68 deg. Low overall heights are maintained by use of hinged bail, making it unnecessary for bucket hooker to reach across half of the bucket as with the usual rigid bail. On discharge unusually large 42-in. diameter center opening prevents arching of concrete. Segregation is prevented by folding action of concrete flow from center of bucket. The 6-ft. diameter, 4-yd. size bucket weighs only 4,000 lb. Rubber seal, adjustable for wear, is furnished on discharge throat to make gate grout-tight. — C. S. Johnson Co. (Koehring Subsidiary), Champaign, Ill.

Bow Saw

New 20-in. bow saw, designed to cut timber in any position without pinching, prying or wedging, is powered by 5-hp. engine and weighs 63 lb. Features include: full 360-deg. swiveling, automatic clutch, automatic control of chain tension, kick-proof starter, special fast-starting magneto, operation of engine in any position and rip-cross chain which is easily sharpened by hand filing without removing chain from saw. Bow is a rigid, strong aluminum-alloy casting while chain track and blade are formed of tool steel.—McCulloch Motors Corp., 6101 W. Century Boulevard, Los Angeles 45, Calif.

Wagnermobile Scoop

New model "C," renamed "Wagnermobile Scoop" is a refinement of previous models, a main improvement being the addition of planetary drive gears to each of the drive wheels. It can be towed behind a truck or pickup at speeds over 20 mph by disengaging the planetary drive. Other improvements include wider chassis, roomier cab, safety glass, shorter turning radius, simplified hoist control and 600-lb. counterweight built into the machine. — Mixermobile Manufacturers, Portland 16, Ore.

Four-Speed Transmission

Designed for both on and off-highway applications where a high percentage of operation through gears in conjunction with auxiliaries is required. Is specially applicable to earth moving equipment. Company now offers a complete series of 4, 5 and 10-speed transmissions with engines of up to 1,120 cu.in. displacement.—Fuller Mfg. Co., Kalamazoo, Mich.

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BELTSVILLE, MD.
BYERS IRON

SOIL AND WATER BOTH CORROSIVE—

so underground steam line replacements are

BYERS WROUGHT IRON PIPE

Spread over almost 20 square miles, the Agricultural Research Center occupies one of the largest areas in the world devoted to research on better farming and farm living. The physical plant includes thirty-six laboratory buildings, thirty-one greenhouses, one hundred barns and storage buildings, five hundred small-animal and poultry houses, plus miscellaneous structures. Heat, supplied by a central power plant, is distributed through an extensive underground system.

Both the soil, and the water—supplied from a brackish swamp—are highly corrosive, so that the maintenance of the piping system has been a problem. Wrought iron has been extensively used in replacements. The illustration at right shows part of three 2000-foot runs of Byers Wrought Iron pipe recently installed between the steam plant and the Administration Building. The 6-inch supply line, the 2-inch vacuum return, and the 1½-inch high pressure return, all wrought iron, are installed in a concrete tunnel with a slab top.

The ability of wrought iron to resist the severe corrosive conditions usually present in underground installations has been confirmed many times, over long periods of years. One example comes from Illinois, where a ten-inch wrought iron underground steam line was installed years ago. At last report, made after 39 years of continuous service, the line was still operating . . . and had required no maintenance whatsoever.

Wrought Iron's unusual resistance to corrosion comes from its unusual composition and structure. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and "detour" corrosive attack, and so discourage pitting. The fibers also anchor the initial protective scale, which shields the underlying metal.

The complete story of what wrought iron is, how it is made, and where it is used is condensed in a booklet, "THE ABC'S OF WROUGHT IRON". We will be happy to send you a copy.

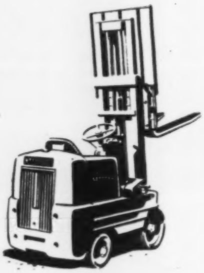
A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

For POWER,

There's a Great New Ford Industrial Engine that's RIGHT for Your Job

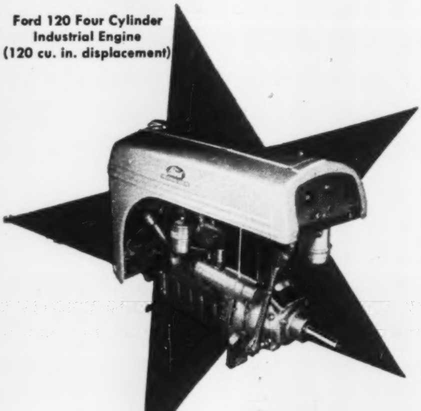


Ford Power is RIGHT 3 Important Ways

1 **RIGHT POWER**—Your choice of five rugged workhorses in the complete Ford Industrial Engine line. There's one just right for your job.

2 **RIGHT FEATURES**—You're always right up to date when you specify Ford Power. Every model has all the latest benefits of Ford's famed progressive engineering.

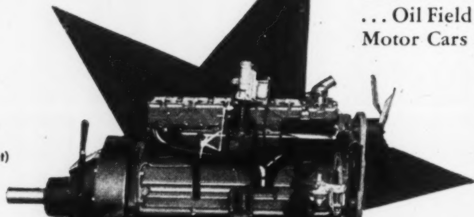
3 **RIGHT SERVICE**—Ford Dealers are everywhere, with the facilities and experience for keeping Ford Industrial Engines right on the job—for longer life, greater service, lower costs.



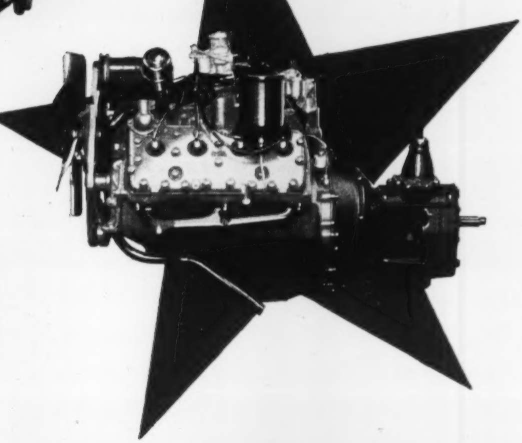
Ford 120 Four Cylinder Industrial Engine (120 cu. in. displacement)

Ford Industrial Engines Power—

Agricultural Machinery . . . Orchard Equipment . . . Air Compressors . . . Road and Construction Machinery . . . Derricks and Hoists . . . Electric Generating Plants . . . Arc Welders . . . Fire-Fighting Equipment . . . Industrial Tractors . . . Lumber and Sawmill Equipment . . . Oil Field Equipment . . . Pumps . . . Railway Motor Cars . . . and many other applications.



Ford 226 Six Cylinder Industrial Engine (226 cu. in. displacement)



Ford 239 V-8 Industrial Engine (239 cu. in. displacement)

YOUR JOB IS WELL-POWERED

Pick FORD

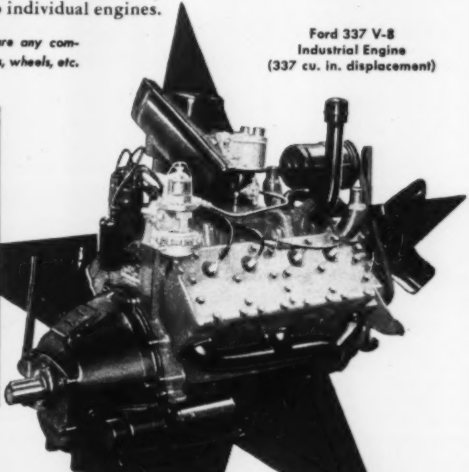
Only Ford Industrial Engines Have All These Features

Made throughout to Ford famed hi-precision manufacturing standards . . . Fully counterbalanced crankshafts . . . Large, precision, replaceable main and connecting rod bearings . . . Long life, high-chrome nickel alloy valves . . . Moly-chrome alloy steel valve seat inserts . . . Shot-blasted, rust-proofed valve springs . . . Full-floating, tubular piston pins . . . Full pressure lubrication to all bearings . . . Deep oil pans with clean-out plates . . . Direct, gear-driven camshafts with aluminum timing gear . . . Removable cartridge type oil filters . . . Hi-capacity, full-jacketed, thermostatically controlled cooling . . . Balanced carburetion . . . Full-automatic distributors . . . Drop-forged connecting rods . . . Plus many other advancements applying to individual engines.

Also available to manufacturers, through the Industrial Engine Department, are any component Genuine Ford Parts including front and rear axles, transmissions, brakes, wheels, etc.

Specifications of Ford Industrial Engines

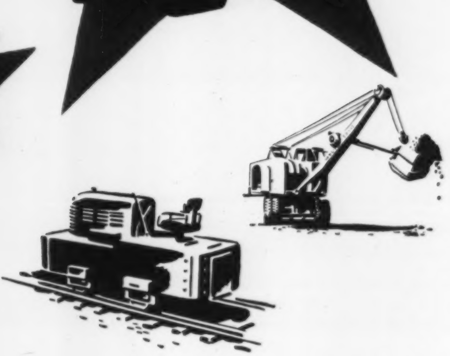
Model	Cylinders	Bore and Stroke	Displ. cu. in.	Dyn. B.H.P.	Max. Torque	Auxiliary Equipment Available
120	4	3$\frac{3}{16}$x3$\frac{3}{4}$	120	36@ 2400	84#' @ 1600	Clutch; 3 and 4 speed transmissions; SAE #5 housing and power take-off. Also complete power unit.
226	6	3.3x4.4	226	80@ 2400	182#' @ 1200	Clutch; 3, 4 and 5 speed transmissions; SAE #3 and #4 housings; power take-off.
239	V-8	3$\frac{3}{16}$x3$\frac{3}{4}$	239	85@ 2400	187#' @ 1600	
254	6	3.5x4.4	254	95@ 2400	212#' @ 1200	
337	V-8	3$\frac{1}{2}$x4$\frac{3}{8}$	337	117@ 2400	257#' @ 1600	Clutch; 5 speed transmission; direct drive power take-off.



Ford 337 V-8 Industrial Engine (337 cu. in. displacement)

Ford INDUSTRIAL ENGINES

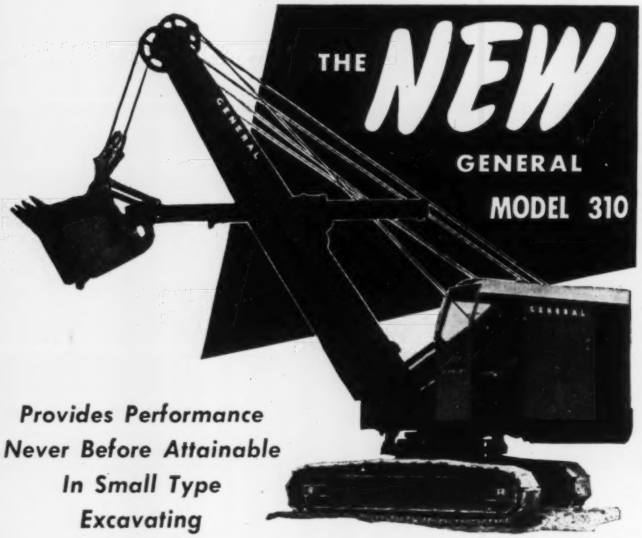
Ford 254 Six Cylinder Industrial Engine (254 cu. in. displacement)



FORD MOTOR COMPANY

INDUSTRIAL AND MARINE ENGINE SALES DEPARTMENT • DEARBORN, MICHIGAN

WHEN IT'S FORD-POWERED



Provides Performance Never Before Attainable In Small Type Excavating Equipment

Model 310 General ¾ Cu. Yd. Power Shovel.

Among the numerous advantages of this new type, crawler mounted GENERAL are 100% air control of basic motions through an air actuated, finger touch lever system . . . "Air Cushion Clutch" on reversing and retract mechanisms . . . bigger, easier operating brakes . . . larger shafts and liberal use of anti-friction bearings . . . deck gears recessed, fully enclosed, and running in oil . . . live, independent, worm driven boom-hoist with power up and power down for Crane, Dragline, and Clamshell service . . . independent travel, two speeds in either direction, steers without stopping . . . drumshaft operates in anti-friction bearings and end is capped with a lifetime, dustproof, GENERAL designed seal.

The GENERAL MODEL 310 is available with independent chain crowd shovel boom assembly, with crane boom for clamshell, dragline, and hookblock work, and as a hoe. Boom assemblies can be changed with a minimum of effort in the field.

●

These new features with the many others provided on the Model 310 give you increased earning power which will pay for the cost of the machine in a very short time. Write for complete details.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO. EXCAVATOR

MARION OHIO

DIESEL GASOLINE OR ELECTRIC POWERED • ⅜ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

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Steel • Pipe • Timber

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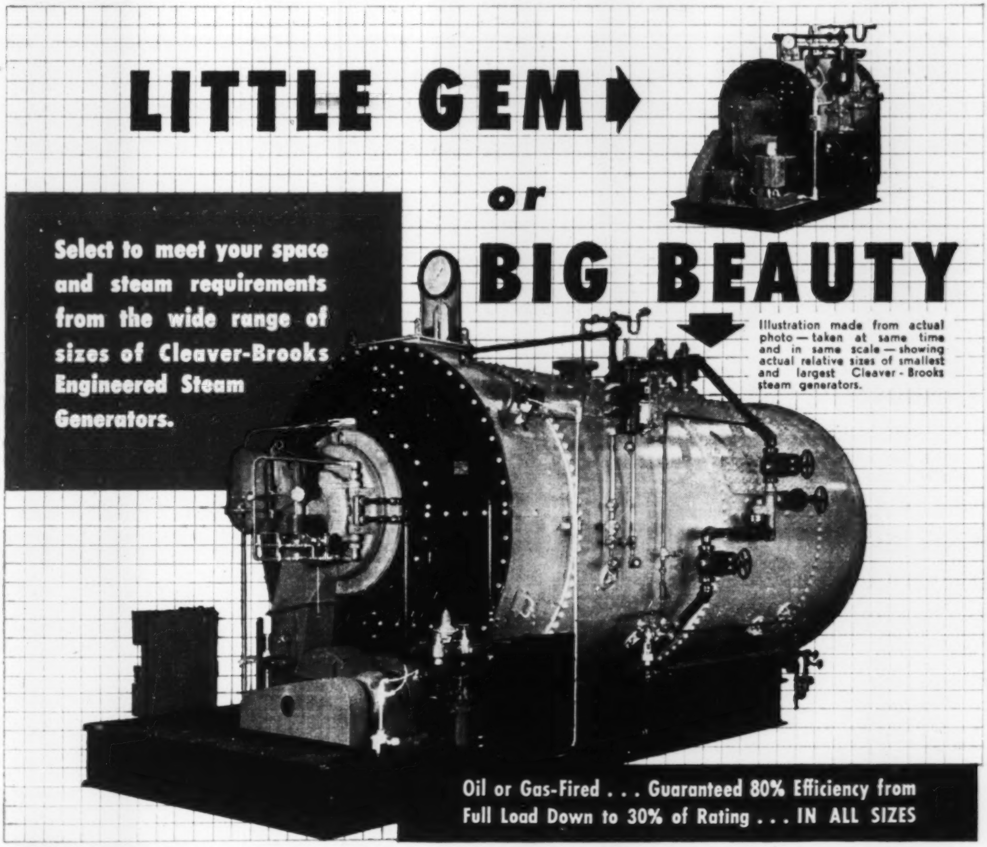
Lightweight Insulation

At extremely low weight insulation trademarked "Ultralite", offers high thermal efficiency. It is pleasant to handle and springs back into its original shape after being compressed. It is fire-resistant, rot-proof, and will not shake down, pack, settle or disintegrate under vibration. Being inorganic, Ultralite never wears out, offers no sustenance to vermin, rodents, bacteria, fungus or termites. The extremely fine glass fibers are odorless, and do not absorb odors or moisture.—GUSTIN-BACON MFG. CO., 1412 WEST 12TH ST., KANSAS CITY, MO.

Straddle Truck

This new Hyster straddle truck has an 18,000-lb. capacity. One of the main features is a spring suspension system which insures better riding and steering, gives more traction for driving wheels, reduces frame stress and tire wear, and facilitates travel over slippery or rough surfaces. Operating

(*Continued on p. 74*)


LITTLE GEM
or
BIG BEAUTY
Select to meet your space and steam requirements from the wide range of sizes of Cleaver-Brooks Engineered Steam Generators.
Illustration made from actual photo — taken at same time and in same scale — showing actual relative sizes of smallest and largest Cleaver-Brooks steam generators.
Oil or Gas-Fired . . . Guaranteed 80% Efficiency from Full Load Down to 30% of Rating . . . IN ALL SIZES

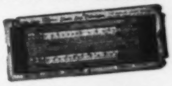
WHY search and "shop" for a boiler — install a Cleaver-Brooks engineered and self-contained unit that fully meets your steam requirements and needs only a minimum of space and headroom.

You can select from a range of sizes 15 to 500 hp. — and you can have your Cleaver-Brooks steam boiler equipped for oil, gas, or with a combination burner which permits alternate use of gas or oil and provides for a quick change-over from one fuel to the other.

Equally important—you get Cleaver-Brooks guarantee of at least 80% efficiency from full load down to 30% of rating — with either gas or oil as fuel — and IN ALL SIZES.

Cleaver-Brooks steam boilers enable you to burn the available fuel in your area — give you clean, smokeless operation — eliminate fuel and ash handling — need no high or costly stacks — no special foundations — fit under low headroom and into limited space — provide flexible operation to meet fluctuating loads — fully meet all codes.

Available in a size to fit your needs — 15 to 200 p.s.i., 15 to 500 hp. — write for Cleaver-Brooks Steam Boiler bulletin.



WRITE on your business letterhead for Free Steam Cost Calculator — a ready reference slide rule showing the comparative steam costs when using oil, gas or coal as fuel.

CLEAVER-BROOKS COMPANY, 389 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver-Brooks

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Whether you're bidding on a small warehouse or a large industrial plant, Luria can help you cut your costs—without "cutting corners." Savings of 20%, 30%, and in some cases as much as 50% have been made possible because Luria buildings offer you these four important advantages:

1. *No Engineering Expense.* Luria buildings are pre-engineered to meet the most exacting codes. Yet they provide the widest possible range of adaptability and architectural freedom.

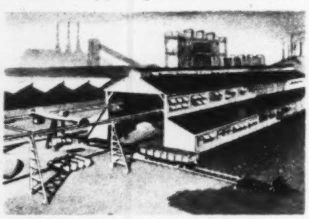
2. *Lower Cost of Materials.* Luria buildings are designed with fewer and *heavier* structural members which are produced in quantity, with less fabrication and handling expense.

3. *Lower Erection Cost.* All field connections are designed for bolting. No welding or riveting is required.

4. *Reduced Maintenance Expense.* Luria's truss-free, rigid-frame design, with all members of heavy, rolled-steel sections, reduces maintenance costs to the minimum.

Before you bid on any new building, be sure to get the complete facts on Luria's standard line. The coupon below will bring you a copy of our new 20-page catalog, together with the name of your nearest Luria distributor.

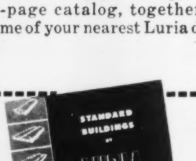
Luria Standard Buildings can, in effect, be "custom tailored" to your exact requirements—for anything from a warehouse...



to the heaviest type of industrial building. Whatever you're planning to build, chances are it's *standard* with Luria.

Standard Buildings by LURIA

"All the advantages of standardization, without the usual limitations"



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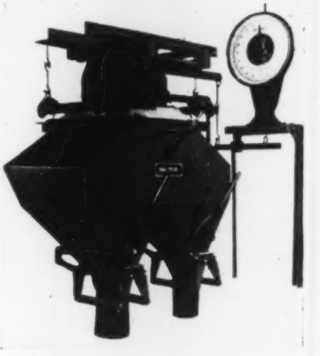
on pneumatic tires and having 4-wheel hydraulic brakes, the truck is powered by a 6-cylinder 82-hp. engine and has four speeds forward and back. It may be geared for maximum speeds of from 30 to 45 miles per hour. Without a load the straddle truck has an average turning radius on level ground of 12¼ ft. A positive acting automatic stop prevents over-run of the worm gear driven roller-chain hoisting and lowering mechanism. — HYSTER CO., PORTLAND 8, ORE.

Acetylene Cylinders

These cylinders have a monolithic filler which permits not only faster filling but more gas capacity. Light weight saves labor, trucking and shipping costs. All Aetna cylinders have five safety plugs and are made in strict conformity with I.C.C. specifications. — AETNA CYLINDERS, INC., 714 FISHER BLDG., DETROIT 2, MICH.



Dual Batchers

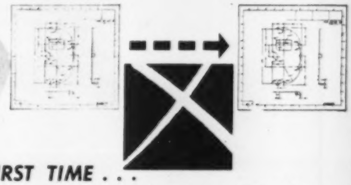
Two new batchers for road builders include a 2½-cu. yd. capacity dual aggregate batcher and a 28-cu. ft. capacity dual cement batcher. They are designed to eliminate less truck stops at the plant, providing faster material handling service.—HELTZEL STEEL FORM & IRON CO., WARREN, OHIO.

Introducing... 3 revolutionary advantages

that lower the cost of photographic intermediates

FIRST TIME . . .

you can print a photographic intermediate in your direct process or blueprint machine . . . and develop it in standard photographic solutions. Kodagraph Autopositive Paper brings you this advantage in the reproduction of any drawing or record—whether it be translucent or opaque . . . old or new.



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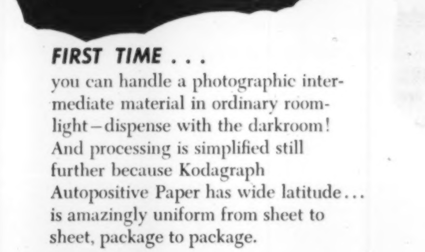
you can produce positive photographic intermediates directly from your originals—without a wasteful negative step. The result every time is a print with dense black photographic lines on a clear, non-curling translucent base—an intermediate that produces uniform prints at practical machine speeds . . . that's "photo-lasting" in the files.

Kodagraph Autopositive Paper



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you can handle a photographic intermediate material in ordinary roomlight—dispense with the darkroom! And processing is simplified still further because Kodagraph Autopositive Paper has wide latitude . . . is amazingly uniform from sheet to sheet, package to package.

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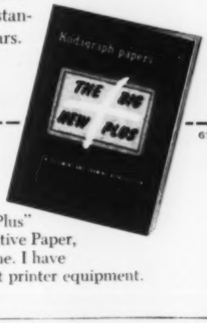

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Please send me a copy of "The Big New Plus"—your booklet about Kodagraph Autopositive Paper, and the other papers in this new Kodak line. I have ☐ direct process ☐ blueprint ☐ contact printer equipment.

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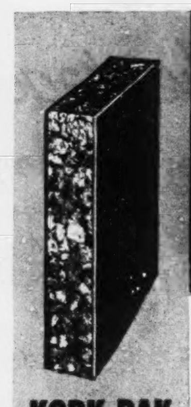

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Para-Plastic!

KORK-PAK
THE IDEAL JOINT FILLER
Because:
- RESILIENT
- NON-EXTRUDING
- WATER-PROOF
- READILY HANDLED

There's no better way to fill a joint than with KORK-PAK—and no better way to protect that joint than with Premolded or hot poured Para-Plastic.

KORK-PAK is non-extruding, more resilient, has low moisture absorption—is readily handled without breakage . . . has everything you want in a premolded joint filler . . . ease of handling, efficiency and low cost.

Premolded Para-Plastic, a development of hot poured Para-Plastic answers the need for a positive water seal in construction joints where it is not practical to hot pour the material. Placed on the sub-soil directly under the expansion joint, Baseal keeps water out for good. In sealing vertical joints, Para-Lateral assures positive vapor and water seal. For offset joints, Para-Plastic Coated Sponge—the pressure seal meets all requirements.

Write for illustrated circulars describing the Servicised Line of asphalt, cork and rubber composition products for the construction industry.

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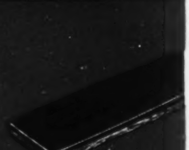
See our Catalog in Sweet's



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JOINT SEALERS

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PRESSURE SEAL

SAVES TIME and COSTS in DIFFICULT JOINT SEALING APPLICATIONS

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Saxe Units place in position and securely hold together structural parts to be welded.

As used in many welded structures they *eliminate all hole punching*, producing an economical, rigid, safe and quickly erected structural frame.

Write for 58 pg. Manual containing full engineering design information for welded structures.

J. H. WILLIAMS & COMPANY
Buffalo-7, New York
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G. D. PETERS CO., Montreal-2, Canada

Manufacturers' Publications

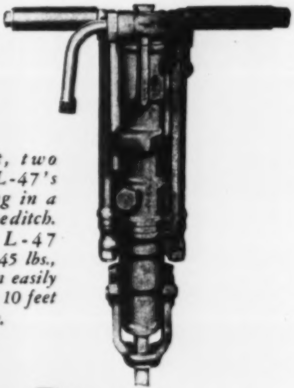
Acid and Chemical Pumps—A bulletin points out how especially exacting duty is put upon pumps when chemicals are used and how the problem is not simply one of handling a fluid but also of resisting destructive action of the fluid itself. Lawrence centrifugal pumps are particularly designed for this purpose. They are furnished either for horizontal or vertical operation and of metals best suited for the given service. — LAWRENCE MACHINE AND PUMP CORP., 371 MARKET ST., LAWRENCE, MASS.

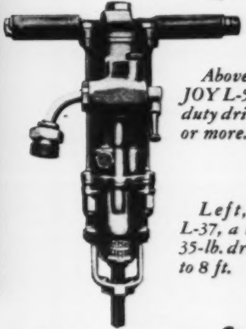
Aerial Surveys — A profusely illustrated booklet tells how to make aerial surveys and maps from photographs. Typical of the contents is this description of reconnaissance strip mapping: This is a highly specialized type of aerial survey for such specific purposes as highway location or relocation, for right-of-way investigation, for preliminary engineering on pipe-line and power-line projects, or for any kind of transmission line or transportation route. Used in conjunction with a profile strip, this map tells the whole story and provides complete background information. Safety engineers, police officials and highway planners should be interested.—ABRAMS AERIAL SURVEY CORP., LANSING, MICH.

Beautifying Concrete—A booklet entitled "How to Beautify and Protect Concrete, Stucco and Masonry" develops the theme that the best way to protect concrete, stucco and masonry against disintegration, stain, dirt and efflorescence is to cover the surface with a protective paint or coating made especially to go over those surfaces and to adhere to them indefinitely. Medusa paint has a base of Portland cement and has a natural affinity for mortar, concrete and stucco.—MEDUSA PRODUCTS DIVISION OF MEDUSA PORTLAND CEMENT CO., 1000 MIDLAND BLDG., CLEVELAND 15, OHIO.

Strong Nails — Circulars describe "Stronghold" annular thread nails and "Screw-tite" spiral thread nails. It is claimed for them that they build stronger houses with tight roofs and squeekless floors. In actual tests these nails have exceeded the holding power of wood screws. The entire gripping surface of every "Stronghold" nail is made up of annular barbs or flanges. —INDEPENDENT NAIL & PACKING CO., BRIDGEWATER, MASS.

Left, two JOY L-47's working in a pipe-line ditch. The L-47 weighs 45 lbs., and can easily drill to 10 feet or more.

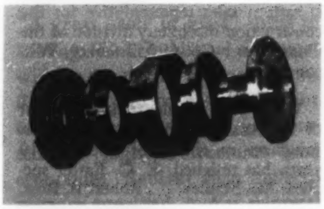




Above, the 55-lb. JOY L-57, for heavy-duty drilling to 15 ft. or more.

Left, the JOY L-37, a hard-hitting 35-lb. drill for depths to 8 ft.

Faster, harder *PUNCH* gives you more footage!



Famous JOY DUAL VALVE makes air do more work

JOY SILVER-STREAK

CADMIUM-PLATED DRILLS

The *exclusive* features of JOY "Silver Streak" Drills—cadmium plating and the famous "Dual Valve"—mean just this to you: faster drilling and less cost per foot of hole—smoother operation, easier on the drill-runner—longer service life and less maintenance. ● Prove these advantages for yourself—write for bulletins, and let us arrange a demonstration for you *on the job!*

SAVE TIME
with JOY THRO-WAY BITS

W&D C2065

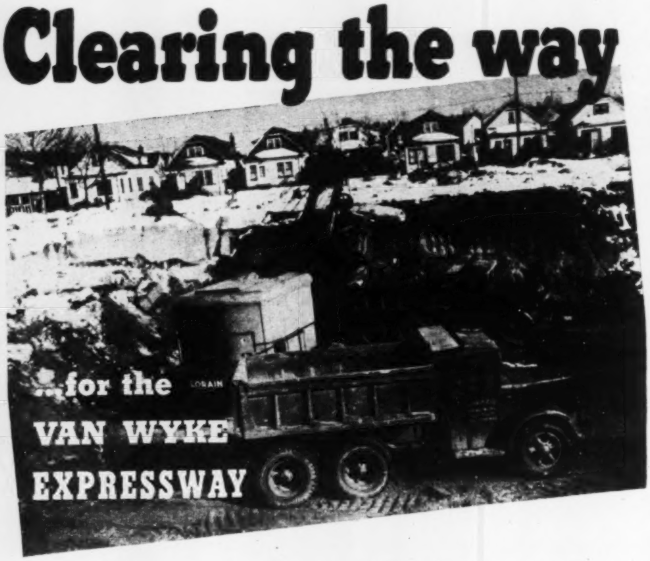
Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Clearing the way



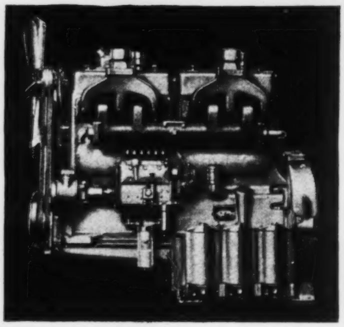
● Earth must move—before traffic can. So they're digging with Diesels—Waukesha Super-Duty Diesels! And at the rate the shovel is digging against this 16½-ft. embankment, that new New York State highway—the Van Wyke Expressway—will be completed in 1950 right on schedule.

The place is Long Island. The E. J. Varrone Construction Co., South Ozone Park, Long Island, N. Y., own the shovel. It's a 2-yd. 820 Lorain shovel—powered by the Waukesha Super-Duty Diesel Six.

It's a potent power producer—this heavy-duty, four-stroke cycle, overhead valve Diesel engine. With the exclusive patented combustion chamber used in all Waukesha Diesels you get unusual Diesel performance . . . clean burning with all standard "high speed Diesel fuels" . . . lively acceleration . . . high economy . . . easy starting . . . simpler maintenance. Send for Bulletin 1415.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK TULSA LOS ANGELES

WAUKESHA



Diesel
ENGINES

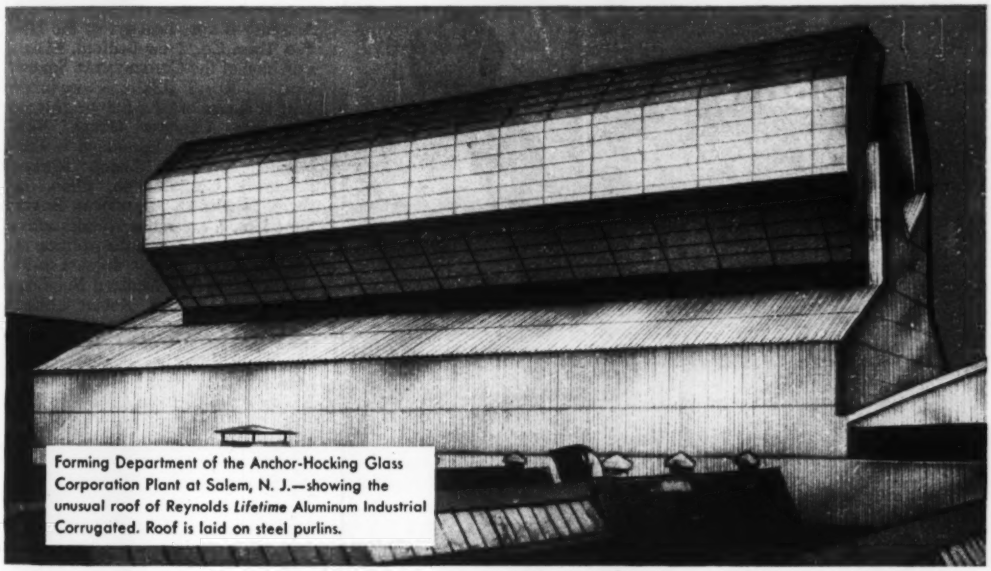
WAUKESHA Super-Duty Diesel (Model 6-WAKD)—six cylinder, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displ.

Manufacturers' Activities

Sales—Paul E. Lundquist is sales manager of the newly-formed construction equipment division of the Pettibone Mulliken Corp., Chicago. . . . Jas. M. Darbaker is general manager of sales, Carnegie-Illinois Steel Corp. . . . Jas. E. Power is manager of national account sales for the mechanical goods division, U. S. Rubber Co. . . . T. R. Johnson is general sales manager of W. R. Meadows, Inc., Elgin, Ill., "Sealtight" paving and building products. . . . Jno. B. Pegram is assistant sales manager of McCulloch Motors Corp., Los Angeles, manufacturer of power chain saws. . . . Vernon Swan has joined Zonolite Co., Chicago, as sales representative at Dixon, Ill.

J. R. White is sales engineer, and Carl. M. Heath sales representative of the special equipment division of the Timken-Detroit Axle Co. . . . R. E. Danto has joined the sales staff of Detroit Diesel Engine division, G. M. C. as a market analyst. In behalf of its retail sales personnel the division has been conducting an intensive training program to provide these men with latest information on sound industrial engine application techniques as applied to the GM Series 71 diesel engine. . . . Wm. A. Clayton is eastern sales representative for the construction machinery division of the Chain Belt Co. of Milwaukee, Wisconsin.

Wells M. Stanley, vice-president of the Alabama Power Co. at Birmingham in charge of sales for 19 years, has resigned, E. C. Easter succeeds Mr. Stanley. . . . Robert B. Ross, civil engineering graduate of the University of Washington, has been appointed sales engineer for the Northwest Tractor & Equipment Corp. at Seattle, Wash. He will specialize in handling Wooldridge earth-moving equipment. . . . Earl B. Maloon, manager of the construction machinery division of Southwest Welding & Mfg. Co. has announced the appointment of A. H. Tetrick as sales manager. Previous to his present appointment Tetrick was with a major manufacturer of heavy construction machinery. . . . Thos. W. Wright has joined the sales staff of the N. Y. district office of The Babcock-Wilcox Tube Co. . . . Dennis E. Tiberiis is now director of sales for Drake America Corp., New York. . . . Robert



Forming Department of the Anchor-Hocking Glass Corporation Plant at Salem, N. J.—showing the unusual roof of Reynolds *Lifetime* Aluminum Industrial Corrugated. Roof is laid on steel purlins.

Anchor Hocking uses Reynolds *Lifetime* Aluminum Industrial Corrugated on Salem, N. J. Building

"A great name in glass" turns to aluminum . . . for roofing. This Industrial Corrugated is .032″ thick, with extra deep corrugations for added strength. Rustproof and corrosion-resistant, it needs no protective painting . . . lasts indefinitely without maintenance. Lighter structural load affords framing economies. Radiant heat reflectivity takes off the summer sun load, makes winter heating more economical. Where under side is exposed, the bright aluminum improves illumination.

Application is simple, over any type of purlin. Reynolds supplies all necessary accessories for complete installations. If you have a special construction or building repair problem, call on our engineers. **Reynolds Metals Company**, Building Products Division, Louisville 1, Ky. Offices in 32 principal cities.

MAIL COUPON NOW

Reynolds Metals Company
Building Products Division
2009 So. Ninth St., Louisville 1, Ky.

Please send full information on:

☐ Reynolds Industrial Corrugated
☐ Reynolds Alumi-Drome

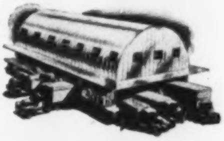
Company____________________

Address____________________

Your Name & Title____________________

REYNOLDS "ALUMI-DROME"

all-purpose prefab!



All-aluminum, Patented all-bolt construction. Basic unit 36′ x 60′, length variable by 6′ sections. Wide choice of door and window arrangements.

IF YOU SEE RUST YOU KNOW IT'S NOT ALUMINUM

REYNOLDS *Lifetime* ALUMINUM BUILDING PRODUCTS

WORLD'S LARGEST PRODUCER OF ALUMINUM BUILDING PRODUCTS

CHOOSE
"QUICK-WAYS"
REG. U. S. PAT. OFF.
FOR SURE PROFITS

Capacity in a truck shovel is fundamental . . . but it isn't enough. Check your requirements against all the advantages "QUICK-WAY" offers:

1. **Convertible Units**
2. **Mobility and Speed**
3. **All-Steel Construction**
4. **Low Center of Gravity**
5. **Accurate Balance**
6. **No Extra Counter-balances**
7. **High Capacity-to-Weight Ratio**
8. **Interchangeable Parts**
9. **Simply and Ruggedly Built**
10. **Economical Operation**
11. **Low First Cost**
12. **Low Maintenance and Repair**
13. **Extra Profits**

Every **"QUICK-WAY"** part will deliver its capacity rating and more, and you get more utility out of a **"QUICK-WAY"** fully equipped, than any comparable equipment. Each **"QUICK-WAY"** is easily converted in minutes from shovel to crane, dragline, clamshell, pile driver, scoop, trench-hoe or backfiller. Buy just the attachments you want to do more jobs better.

The essentials built into every **"QUICK-WAY"** mean sure profits on a small investment; economical to buy, economical to use, it's one of the most useful machines you can own. There's a **"QUICK-WAY"** owner near you; ask HIM. Your nearby **"QUICK-WAY"** distributor has a pleasant surprise for you when you ask him for prices.

MODEL E: 4/10 cu. yd. cap. mounts on any standard 5-ton truck.
MODEL J: 1/4 cu. yd. cap. mounts on any standard 1½-ton truck.

"QUICK-WAY"
TRUCK SHOVEL COMPANY
DENVER, COLORADO
WORLD WIDE DISTRIBUTOR SALES AND SERVICE

A. Smith is sales manager of the Hy-Pro Tool Co., New Bedford, Mass., a division of the Continental Screw Co. . . . Roy S. Adkins is vice-president in charge of sales for the North American Cement Corp., New York. . . . W. H. Hammond is vice-president of the Marion Metal Products Co., Marion, Ohio, in charge of sales. . . . American Brake Shoe Co., is expanding its sales activities in Cleveland with the addition of the National Bearing division in its sales offices at 915 Midland Building. L. E. Hoyer and J. Robert Lottes, National Bearing sales representatives, will join representatives of the company's Brake Shoe & Castings, Southern Wheel, and Ramapo Ajax divisions in the enlarged office, under the direction of James J. Nelson, eastern sales manager for National Bearing.

Distributors—Machinery & Supplies Co. Inc., Kansas City, Mo., is now a distributor of Hyster lift trucks, straddle trucks and mobile cranes. . . . Lewis & McDowell, Inc. is district representative in the New York area for Pensteel Products Co., Washington, Pa. . . . L. Sonneborn Sons, Inc. is exclusive national distributor for Phenoplast in the industrial and institutional maintenance fields. . . . Additional distributors for the Diamond Chain Co., Indianapolis, Ind., are: Akron, Ohio.—Century Supply & Equipment Co.; Billings, Mont.—Hines Bearing & Industrial Supply; Columbus, Ohio—The Ross-Willoughby Co.; Toledo, Ohio—Ralph Shawaker Co.; Kalamazoo, Mich.,—Joseph E. Loughead Co.; Greenville, S. C.—J. W. Vaughan Co., Erie, Pa.—Crossley Co.; El Paso, Tex.,—The Mine & Smelter Supply Co.; Albuquerque, N. M.—The Harry Cornelius Co.

Personalities—Stanley S. Willis has been appointed Chicago district manager of the brass division of Kerotest Mfg. Co., Chicago. . . . John J. Hall has been elected president of the Richmond Radiator Co., Richmond, Va., an affiliate of the Reynolds Metals Co., Chicago. . . . Geo. B. Richardson, has been named civil engineer for the A. E. Staley Mfg. Co., Decatur, Ill. . . . Stanley M. Hunter has been elected executive vice-president of the American Hoist & Derrick Co., St. Paul, Minn. . . . Ronald E. Griffiths, for three years supervisor of the American Steel & Wire Co. research laboratory in Cleveland, Ohio, has been appointed assistant director of research for the company, H. B. Jordan, vice-president-operations of the U. S. Steel sub-

"Better equipment performance

with **GULF QUALITY LUBRICANTS and FUELS**

helps us beat contract schedules"

says North Carolina Contractor

Wayne Engineering & Construction Company, Inc., Mt. Olive, North Carolina, has the contract for work on North Carolina Route No. 581 in Wilson and Nash counties. This project, to cost $288,000, involves clearing and grubbing 110,000 yards of earth, 50,500 tons of macadam, and 140,000 square yards of surface treatment.

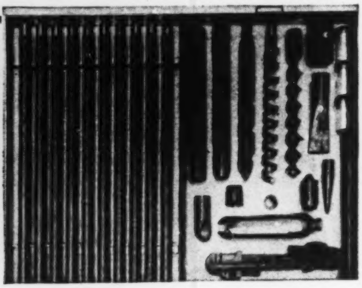
WAYNE Engineering & Construction Company, Inc., like many other leading contractors, has a proven formula for making equipment deliver beat-the-schedule performance: Gulf quality petroleum products, plus careful maintenance. This formula has paid big dividends over a period of years.

Always of the same uniform high quality, Gulf lubricants and fuels work as a team to help contractors do a speedier, more profitable job. Gulf lubricants provide an extra margin of protection to equipment under all types of operating conditions—and Gulf fuels insure maximum engine power and efficiency.

GULF

Gulf Oil Corporation · Gulf Refining Company *Division Sales Offices:* **Boston · New York · Philadelphia · Pittsburgh Atlanta · New Orleans · Houston · Louisville · Toledo**

ACCURATE
DEPENDABLE
SUBSURFACE
INFORMATION



ACKER SOIL SAMPLING KIT

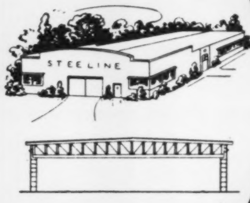
- Twelve soil and earth sampling tools in handy steel box.
- Can be carried in any automobile.
- Depths limited only to driving power of sledge or maul.

- Thirty years' experience has proved these tools will recover accurate samples from practically all earth materials.
- MANY USES include aluminum silicate deposits—brick and clay materials—foundation test borings—gold bearing sands—kaolin and clay for ceramics—sand and gravel pits—subgrade testing for highways and airfield runways—base materials.

ACKER DRILL COMPANY, INC.
SCRANTON 3, PA.

STEELINE FLAT TRUSSES

for MASONRY WALL CONSTRUCTION



- Spans up to 60 feet.
- Four to six weeks delivery.
- Quality construction at low cost.
- Standard Trusses are flat, pitched all one way or pitched two ways from center line.
- Steel deck also furnished if desired. This will provide a fire safe foundation for insulation and built up roofing.

PITCHED ROOF SYSTEMS AND COMPLETE STEEL BUILDINGS ALSO AVAILABLE

Gentlemen:

I am interested in more information on:
(a) STEELINE Flat Trusses and Roof Deck ☐ Width
(b) STEELINE Pitched Roof Systems ☐ Length
(c) Complete STEELINE Buildings ☐ Height

Name
Firm
Address

CAREW STEEL PRODUCTS CORPORATION • YORK, PA.

sidiary has announced recently.

Deceased—Jas. E. Manning, Jr., 56, president of the ROCKWOOD ALABAMA STONE Co., and a director of the GEO. A. FULLER Co., died at Harrison, N. Y., March 16. . . . Oscar Lampl, 44, assistant manager of DRAVO-DOYLE Co., Pittsburgh, Pa., died there March 23. . . . Jas. A. Williams, 75, vice-president of the CAMP MFG. Co., Franklin, Va., died in Richmond, March 22. . . . M. James Ruggerio, 63, president of the ACME SAND & GRAVEL Co., and the STANDARD EQUIPMENT & CONTRACTING Co. died March 20 at his home in Belmont, Mass. . . . Walden W. Paape, 48, domestic sales manager of the EUCLID ROAD MACHINERY Co., Cleveland, Ohio, died at Willoughby, Ohio, March 18.

Miscellany—Headquarters of U. S. MENGEL PLYWOODS, INC., is now at 1,215 So. 7th St., Louisville, Ky. . . . COCHRANE CORP., Philadelphia, Pa., has acquired substantially all of the capital stock of LIQUID CONDITIONING Co., of Linden, N. J. . . . Production capacity of the UNIVERSAL CONCRETE PIPE Co., plant at Decatur, Ala., has been tripled by a recently completed expansion program. . . . The National Safety Council has given a distinguished service award to a Cleveland, Ohio, plant of the AMERICAN STEEL & WIRE Co. for a record of 3,000,000 man-hours without a lost-time accident. . . . THE GEO. RAEKLE & SONS Co., Cleveland, Ohio, 79-year-old manufacturers of concrete roof decks, floor slabs and cast stone, has opened a branch plant in Houston, Tex. . . . SKF INDUSTRIES, INC., has an inventory-availability service which each month calls to the attention of leading customers in each of the company's sales territories what bearings they use that are in stock or expected to be in stock within a 30-to 90-day period. . . . WAGNER ELECTRIC CORP. of St. Louis, Mo., has acquired a 90,000 sq. ft. floor space plant on eight acres at Mt. Vernon, Ill. . . . CREDLE EQUIPMENT, INC., Utica, N. Y., has changed its name to CREDLE-NOLAN EQUIPMENT, INC. . . . In Providence, R. I., BUILDERS PROVIDENCE, INC., and associated companies recently honored 62 employees, with service ranging from five to twenty-five years. Five employees had a combined service total of 228 years. . . . LAYNE and BOWLER, INC., vertical turbine pump manufacturers of Memphis, Tenn., and its sixteen affiliated well water supply companies, announce that the latest addition to the Layne organization, is the GENERAL FILTER Co. of Ames, Iowa.

Elections and Activities

Officers of the Louisiana Section of the American Society of Civil Engineers for 1949 are: Walter H. Scales, president; Bernard Dornblatt, first vicepresident; E. M. Freeman, second vicepresident; F. W. MacDonald, secretary-treasurer; Robert Bland, assistant secretary.

The Baltimore Post, Society of American Military Engineers, has elected these officers: William G. Armstrong, president; James I. Crout, vicepresident; Frank K. Gayle, reelected secretary-treasurer; Leslie I. Royston, assistant secretary-treasurer; Directors, William R. Kahl, Fred W. Steiner and Clarence C. Neher.

C. B. Fulghum, of Selma, has been elected president of the North Carolina Society of Surveyors. Other officers: J. Chandler Eakes, Sanford, vicepresident; and Edward W. Ruggles, North Carolina State College, secretary-treasurer.

Park L. Metzger has been re-elected president of the General Contracting Employers' Association of Buffalo, N. Y. Herbert F. Darling is vice-president, and Richard C. O'Keefe, executive vice-president. One new member, Charles A. Smith, was named to the executive committee. Re-elected were Metzger, Darling, O'Keefe, Daniel B. Niederlander, N. Osborne Siegfried, Joseph Davis, Paul R. Schieve and John A. Lockie.

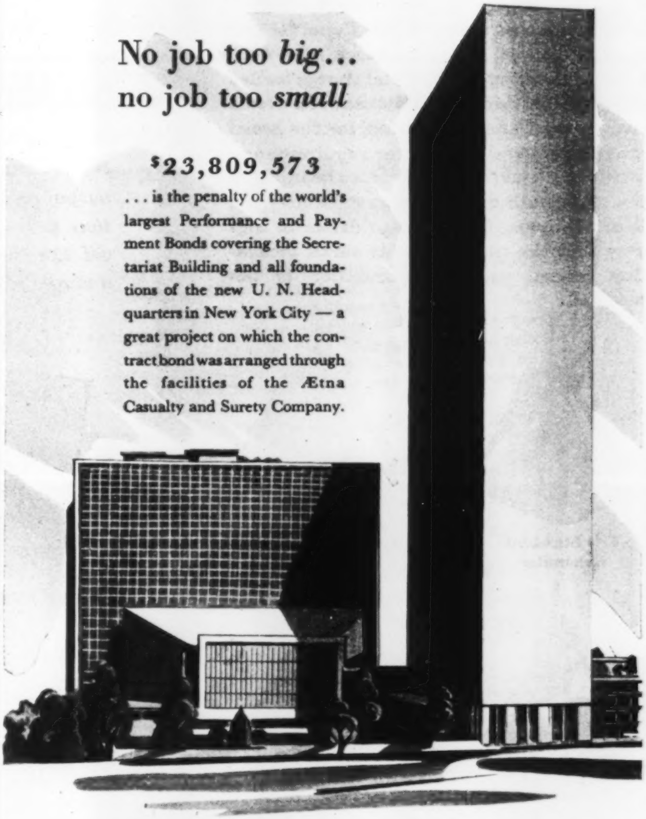
The Southern Tile Contractors Association has elected these officers: H. T. Brownell, Birmingham, president; George W. Cater, Kinston, S. C., first vice-president; Ray C. Smith, Knoxville, second vice-president; Homer C. Panter, Birmingham, secretary-treasurer.

R. A. Merrill, head of the University of Chattanooga engineering department, has been elected president of the newly organized Tennessee Society of Professional Engineers. Other officers: James E. McDonald, Knoxville, first vice-president; W. R. Burton, Kingsport, second vice-president; B. M. Ross, Nashville, state treasurer; George Campbell, Chattanooga, secretary, and W. A. Coolidge, Nashville, national representative.

Robert W. Millard, city engineer of Ely, Nev., has been elected president of the Eastern Nevada chapter, Society

$13,497 A small job, dollarwise, the required contract bond covering the construction of this service station in New Britain, Connecticut, was written by the Ætna Casualty and Surety Company, which stands ready to serve your needs on jobs both large and small, public and private, in all parts of the United States and Canada.

Service Station . . .
or Skyscraper



No job too *big*...
no job too *small*

$23,809,573

. . . is the penalty of the world's largest Performance and Payment Bonds covering the Secretariat Building and all foundations of the new U. N. Headquarters in New York City — a great project on which the contract bond was arranged through the facilities of the Ætna Casualty and Surety Company.

ÆTNA Agents from coast to coast

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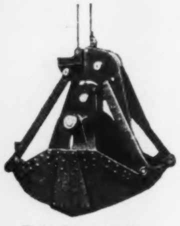
HARTFORD 15, CONNECTICUT

HOW TO SELECT THE CORRECT BUCKET FOR THE JOB!

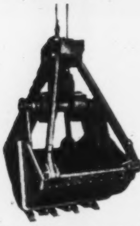
Erie Bulletin 2L-2 describes in detail the design and construction of 4 classes of 2-line clamshells: (*Standard*) for rehandling of loose material, (*Barge Type*) for unloading barges, flats, for stock pile work and for cleaning up material that is loaded to a shallow depth and distributed over a large area, (*General Purpose*) for the broad range of general contractor requirements, including medium heavy excavating and the rehandling of compact materials, (*Hard Diggers*) for severe underwater digging and the most difficult earth excavation where unusual durability is demanded.

Consult Gross Load Tables *under each of 4 classes of Erie 2-Line Buckets. This gives the gross load for each of 43 Standard buckets in 9 kinds of material. Is your crane under or over loaded on bucket work? Drop us a line giving your make and size of crane and the kind of materials to be handled. We'll show you how to get maximum output on bucket work. A little attention to this important factor may pay off the cost of the correct bucket on a single job.*


Erie Standard Rehandler

Erie General Purpose Clamshell

Erie Barge Type Rehandler


Erie Hard Digging Clamshell

ERIE 2-LINE Clamshell BUCKETS

ERIE STEEL CONSTRUCTION COMPANY • ERIE, PA.

Write FOR BOOKLET 2L-2

ERIE
STEEL CONSTRUCTION COMPANY

194 GEIST ROAD • ERIE, PENNSYLVANIA

of Professional Engineers. W. G. Sandell, McGill, was chosen vice-president; Harold Bishop, Kimberly, secretary-treasurer, and A. J. O'Connor, Kimberly, was chosen as a two-year trustee.

Harold W. Chutter, Fresno, Calif., was re-elected president of the California Associated Concrete Pipe Manufacturers for his 15th consecutive term recently. Fred Lin, Merced, was chosen vice-president and Hugh Pollard, Fresno, was elected secretary-treasurer.

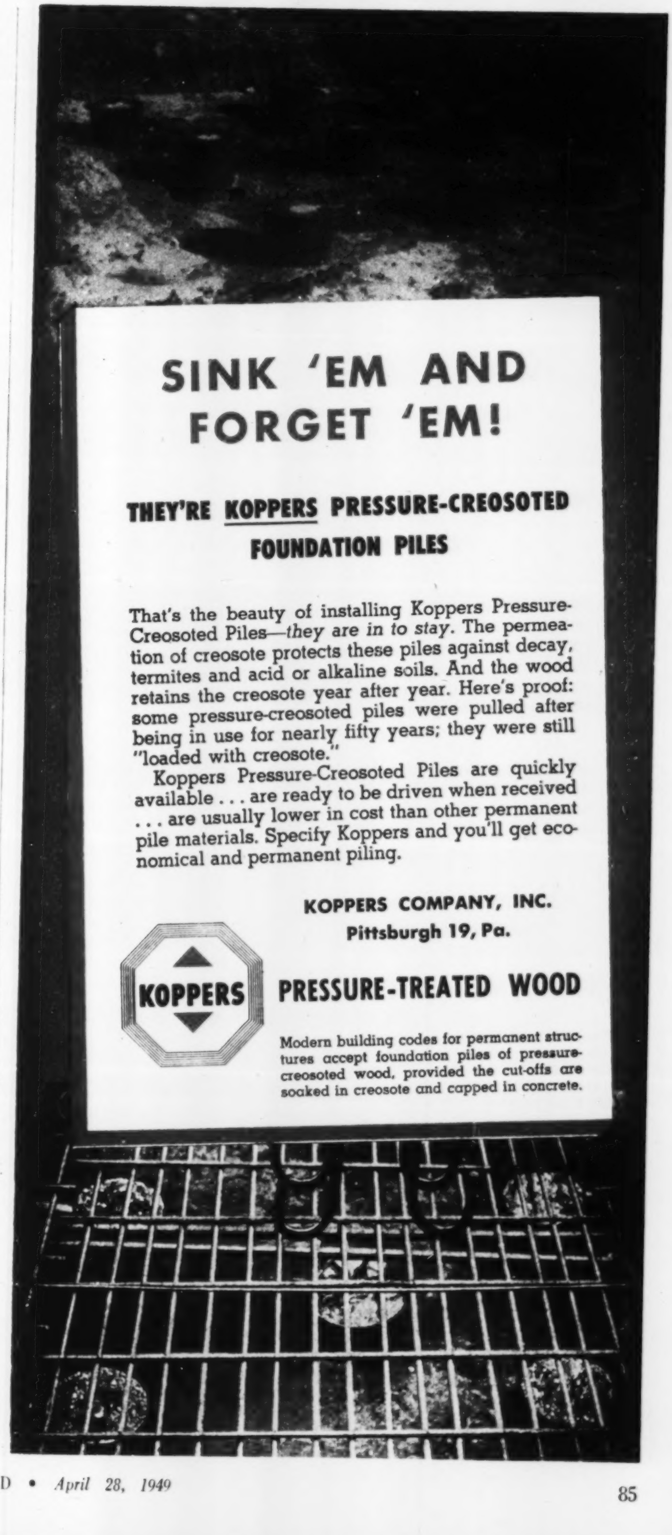
Almost a thousand construction men attended the recent annual dinner of the Constructors Association of Western Pennsylvania in honor of the retiring president, Dan Dinardo. The following were elected to the board of governors for the coming year:

Heavy Division—Charles R. Carter, Ferguson & Edmondson; Wm. E. Crawford, George Vang, Inc.; Dan Dinardo, Dinardo, Inc.; Samuel L. Fuller, John F. Casey Co.; Carl J. Jacobsen, Carl J. Jacobsen, Inc.; Carl B. Jansen, Dravo Corporation; and J. E. O'Leary, Pittsburgh Des Moines Steel Co.

Highway Division—Max C. Harrison, Harrison Construction Co.; Wm. F. McCrady, McCrady Construction Co.; Wm. R. McQuade, James H. McQuade & Sons Co.; James Nardulli, Nardulli & Sons Co.; Roy F. O'Mara, Allegheny Asphalt & Paving Co.; Frank O. Patterson, Patterson Construction Co.; and Russell C. Swank, Freeland Construction Co.

Greater recognition of engineers as professionals was urged by Harold H. Funk, public relations chairman of the New York Chapter, Society of Professional Engineers, upon members of the Rochester, N. Y., chapter. About 250 engineers, including State President William W. Perry of Binghamton and a delegation from the Erie Chapter, heard Funk suggest an 8-point program to raise professional standing. The speaker reviewed the history of legal recognition of law and medicine, and asked that engineering be given the same status.

Gold medals for professional and public service were presented to two Philadelphians at the 35th annual dinner of the Metropolitan Philadelphia Chapter, American Public Works Association. The recipients were Stephen B. Sweeney, executive director of the Department of Local and State Government, University of Pennsylvania and Frederick T. Thorpe, Jr., surveyor of the Bureau of Engineering, Surveys and Zoning, Department of Public Works.



SINK 'EM AND FORGET 'EM!

THEY'RE KOPPERS PRESSURE-CREOSOTED FOUNDATION PILES

That's the beauty of installing Koppers Pressure-Creosoted Piles—*they are in to stay*. The permeation of creosote protects these piles against decay, termites and acid or alkaline soils. And the wood retains the creosote year after year. Here's proof: some pressure-creosoted piles were pulled after being in use for nearly fifty years; they were still "loaded with creosote."

Koppers Pressure-Creosoted Piles are quickly available . . . are ready to be driven when received . . . are usually lower in cost than other permanent pile materials. Specify Koppers and you'll get economical and permanent piling.

KOPPERS COMPANY, INC.
Pittsburgh 19, Pa.

KOPPERS

PRESSURE-TREATED WOOD

Modern building codes for permanent structures accept foundation piles of pressure-creosoted wood, provided the cut-offs are soaked in creosote and capped in concrete.

30 seconds does it . . . for JOE RAMSETTER

No drilling or plugging for JOE RAMSETTER. In 30 seconds, he does the complete job of setting pins or studs to accurate positions in steel, concrete, masonry. Just load the light, portable RAMSET TOOL, press against the work and RAM! Fastener sets quicker than a wink—tightly, easily.

No electric lines or air compressors! RAMSET is self-powered, carried in one hand from job to job, always ready to set, instantly, pins and threaded studs up to 6" long and 5/8" diameter. On continuous work, any good workman can "RAMSET" up to 50 fasteners per hour.

Ask for a 15-minute RAMSET demonstration. You'll see why it breaks all records for speed and economy on fastening jobs, pays a profit on every setting.

Ramset
FASTENING SYSTEM

Stemco Corporation,
Cleveland 16 (Rocky River), Ohio.
In Canada—Globe Machine Tools, Batawa, Ontario.

Stemco Corporation, EN 4
Cleveland 16 (Rocky River), Ohio
Please send details and arrange 15-minute demonstration of RAMSET FASTENING SYSTEM. No obligation, of course.

Name ______________________

Company ______________________

Address ______________________

Men and Jobs

Joseph H. Ehlers has been appointed to take over the Washington, D. C., office of the American Society of Civil Engineers, succeeding **E. Lawrence Chandler,** who moved to New York headquarters a year ago upon becoming assistant secretary of the society. Mr. Ehlers, a practicing engineer and attorney, will serve on a part-time basis with the title of field representative. Before entering private practice in Washington, he was chief of the consulting engineering division of the Federal Works Agency.

The Kegarise Engineering Co., consulting engineers, headed by **Ralph R. Kegarise,** has moved its offices from Johnson City, Tenn., to Winston-Salem, N. C. **L. E. Fletcher** is chief engineer in charge of civil and structural engineering.

W. P. Hannigan is construction engineer for the Alabama Division, Southern Bell Telephone and Telegraph Co., at Birmingham. He has been with the company since 1925.

Homer Graves, assistant designing engineer on Ross Dam, has retired from the City Light engineering department at Seattle, Wash., after 27 years of engineering work on the Skagit hydroelectric project, of which Ross Dam is the latest unit. A graduate of Allegheny College, he joined City Light in 1921 as field draftsman with a survey crew on the project. He later advanced to structural designer, associate engineer and office engineer.

Col. W. K. Wilson, Jr., St. Paul, Minn., District Engineer, Corps of Engineers, recently visited Fairbanks, Alaska, where engineers from the St. Paul District are studying construction methods on permafrost, or permanently frozen ground. He was joined at Edmonton, Alta., by Col. John R. Noyes, Commissioner of Roads for Alaska, Maj. Gen. Stanley L. Scott, Commanding General of the Army in Alaska, and Brig. Gen. Paul F. Yount, Assistant Chief of Transportation for the Corps of Engineers in Washington.

John Shepard Parke, vice-chairman of the New York City Housing Authority, has been re-elected. He is executive vice-president of Presbyterian Hospital. An expert in architectural engineering, Mr. Parke was associated for 20 years with Marc Eidlitz

SMITH Impulse Turbines

FOR HIGH HEADS, and wherever the head and water quantities available prohibit the use of reaction-type machines. Ideal for installations in remote localities because of the ease with which the completed unit may be transported. The simplicity of design, facility of operation and greater dependability remove the necessity of skilled operators and attendants. Smith's solid-cast runner design provides the additional advantages of closer spacing of buckets resulting in increased speed and consequently, a decrease in the size of the turbine unit, as well as the generator. Write for your copy of our Bulletin — "Impulse Turbines by SMITH!"

S. MORGAN SMITH COMPANY

YORK, PENNSYLVANIA

Impulse runner of *solid-cast* design, an exclusive SMITH advantage.

POWER *by* SMITH

THE

New

"CEMENT GUN"

BULLETIN

IS READY!

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
MANUFACTURERS OF THE "CEMENT GUN"

It is filled with "on the job" pictures and describes many of the varied operations we have performed successfully and economically with "Gunite" and the "Cement Gun".

Photographs cover many types of work including repairs to reservoirs, dams, sewers and bridges. Pre-stressed tanks, swimming pools, steel encasement and pile encasement are included as well as other uses and design data and specifications.

A request on your letterhead will bring you a copy by return mail. Ask for Bulletin X2400.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.

MANUFACTURERS
OF THE
CEMENT GUN

PUMP RIDES AIRBORNE. . .TO EACH LOCATION!

ANOTHER EXAMPLE OF COMPACT, DEPENDABLE...

WISCONSIN HEAVY DUTY *Air-Cooled* ENGINE *Serviceability*

Whether riding airborne by helicopter . . . or "washing down" special shot-hole casings 90 ft. deep while engaged in geophysical exploration work . . . or handling any of a great variety of engine power field operations in construction service, Wisconsin Air-Cooled Engines pay off handsomely in terms of easy portability and heavy-duty dependability.

Combining compact design, light weight, and heavy-duty construction with plenty of reserve horsepower for the hard pulls, *plus* trouble-free AIR-COOLING . . . Wisconsin Engines meet the varying demands of climatic and work conditions. Weather-sealed rotary type high tension OUTSIDE magneto, equipped with impulse coupling assures easy starting and sure-firing. Tapered roller bearings at BOTH ends of the crankshaft provide maximum protection against bearing failure.

Supplied in 4-cycle single cylinder, 2-cylinder and V-type 4-cylinder types, in a full power range, 2 to 30 hp.

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

& Sons, Inc., now known as Vermilya-Brown Co., Inc. While there he supervised the construction of Columbia Presbyterian Medical Center, Mary Harkness Home in Port Chester, N. Y., Memorial Hospital, Spellman Pavilion at St. Vincent's Hospital, the new library at Columbia University, and a large number of other institutional buildings. He saw action in France with the 27th Division during the war. He was graduated from Cornell University in 1923.

Lt. Col. John W. Miles, Corps of Engineers, has been assigned to duty as resident engineer at Detroit Dam on the North Santiam River in western Oregon. Construction on the dam, a unit of the Willamette basin flood control project, will be started this spring. Colonel Miles has been serving as a special assistant to **Col. O. E. Walsh,** Portland district engineer, and has been in charge of flood control design and construction programs.

Wilford B. Robison, formerly deputy Toledo divisional engineer for the Ohio Highway Department, and **Donald H. Buckhout,** architect, have joined Bellman, Gillett & Richards, Toledo architects and engineers.

The Virginia Highway Department has appointed **Richard V. Lancaster, III,** assistant resident engineer at Warrenton. He will assist Resident Engineer **J. E. Johnson** in handling road work in Prince William, Fauquier and Rappahannock counties. A veteran, he is a graduate of Randolph Macon College, Ashland, and has been with the highway department since 1938.

Charles F. Tupper, former manager of the aviation department, Houston, Tex., Chamber of Commerce, has become regional manager of Airways Engineering Corp., Washington, D. C. His headquarters will be in the Merchants & Manufacturers Building, Houston.

Lewis A. Lush, city engineer of Springfield, Ill., has been appointed Sangamon County superintendent of highways, succeeding **Ray V. Tilly,** resigned.

Frank L. Allen, regional forest service engineer for the last 27 years at Ogden, Utah, has retired. A specialist in road, trail and bridge building, he was at one time with the U. S. Public Roads Administration and the Utah State Highway Commission. He is a graduate of the University of Utah.

If you are using carburizing steels . . .

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In many applications like these	in which these steels are generally used	you will save money by using
Aircraft gears, shafts, pinions, etc.	E-3310, E-9310 or equivalent AMS Specification	U·S·S SuperKore A
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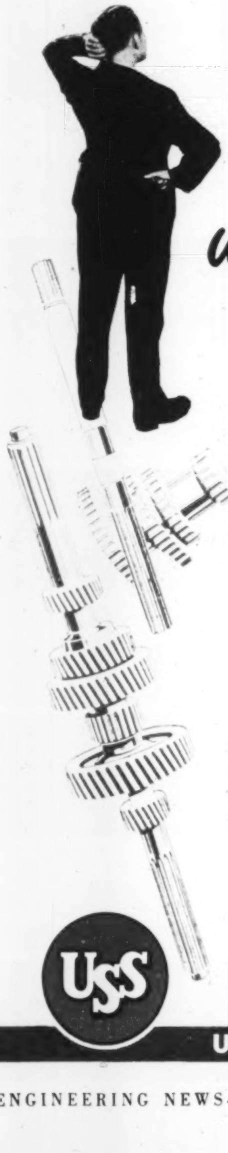
Heavily loaded gears, shafts, pinions etc. and carburized parts used in oil well drilling industry.	4815, 4820	U·S·S SuperKore B
Gears, shafts, pinions, etc.	4317, 4320	U·S·S SuperKore C



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That is because our metallurgists had *lower-users'-costs* in mind when they set out to develop U·S·S SuperKore. Because SuperKore Steels are lower in total alloy content they cost less to start with. And because the alloying elements are used more effectively and the steels are further improved by special manufacturing practices, SuperKore Steels have improved carburizing characteristics. They have better machinability, and they are easier to anneal. Therefore they can be turned into superior finished parts at lower cost.

U·S·S SuperKore Steels are now available in four different grades —each designed for a *specific* type of heavy duty service. Find out where you can apply them to reduce your costs, to simplify inventory and specification details. To guide you in their most economical and practical application, the men who developed SuperKore will be glad to assist you. The "Superkore Booklet" will give you further interesting information. You can obtain a copy by writing to Carnegie-Illinois Steel Corporation, Room 2070 Carnegie Building, Pittsburgh 30, Pennsylvania.

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Engineering Schools

(*Continued from page 38*)

New Courses

A new development in the engineering department of Alabama Polytechnic Institute at Auburn is credited to Prof. Arthur S. Chase, teacher of highway engineering in the civil engineering department. It is a course in soil mechanics which involves the technical development of local soils to be used in low cost paving. Professor Chase is a member of the education committee of the American Road Builders Association, which is studying ways and means of interesting young engineers in highway work.

Massachusetts Institute of Technology and Pomona College, Claremont, Calif., have completed arrangements for a combined 5-year course leading to the B.A. degree from Pomona and S.B. from M.I.T. Students will spend three years at the liberal arts college at Pomona and then will transfer, upon recommendation of the science faculty of Pomona, to M.I.T., where they will be admitted to advanced standing without entrance examination. After two years in any of the institute's regular 4-year courses, including engineering, science, architecture, aerodynamics, the two degrees will be conferred.

The University of Michigan is offering a series of summer symposia in engineering and applied mechanics. Each year a different phase of mechanics is emphasized, although courses are offered in all fields with the cooperation of all departments of the university. This summer the symposium will emphasize the theory of elasticity and structures. Guest professors will include: Sir R. V. Southwell, formerly rector of the Imperial College of London; S. Timoshenko of Stanford University; and E. Reissner of the Massachusetts Institute of Technology. They will offer advanced courses as a part of the symposium.

Helping the right man to choose and prepare for the right job is the purpose of the new "Careers" course which opened with the spring semester at Stevens Institute of Technology. Leading industrialists are lecturers in the course, which was originated and is sponsored by the alumni association. Planned as an occupational survey of engineering fields and types of work, it will consist of a series of 15 weekly

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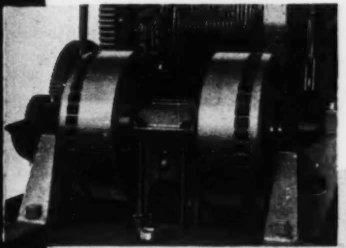
*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.



lectures by various alumni and others outstanding in their fields.

Educational Notes

New Jersey's outstanding examples of modern road and bridge construction have been selected for study by the Brooklyn Polytechnic Institute civil engineering department under arrangements with State Highway Commissioner Spencer Miller, Jr.

Farr and Fowler Halls, first two dormitories completed and occupied in the long-range $15,000,000 development program at the Illinois Institute of Technology, Chicago, were dedicated April 11. The two buildings accommodate 218 students and the total cost was $479,280, including land, landscaping and furnishing.

The student chapters of the ASCE of the North Central region held their annual spring conference at Case Institute of Technology, Cleveland, on April 21-22. Twenty colleges were represented and among the subjects considered were building codes, professional registration, toll roads, and "science and the modern world."

Engineering graduates were told recently by Nathan W. Dougherty, dean of the University of Tennessee college of engineering, that results of a recent survey showed that small industries are an unexploited source of engineering employment. "We are at the crest of the boom in engineering employment and the number of job opportunities will be reduced," Dean Dougherty said. The dean predicted that the peak in the number of engineering graduates in the country would be reached during 1950 and that after that normal demand will be in keeping with the supply.

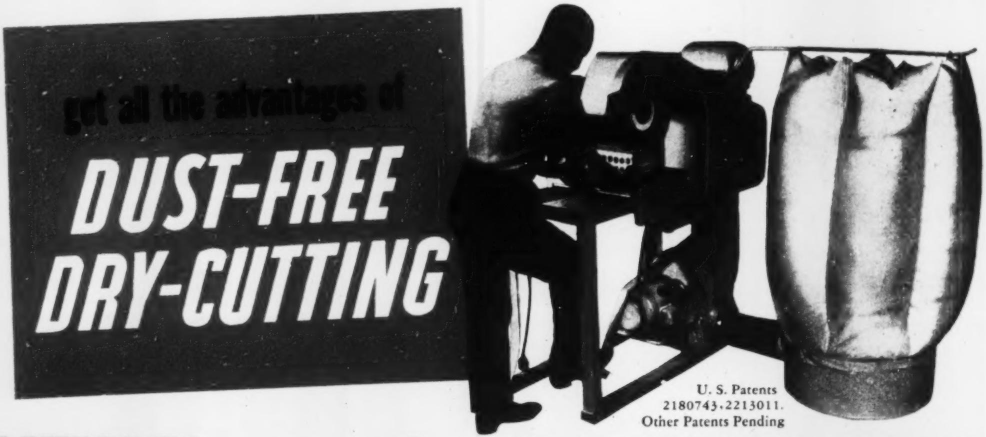
The Fund Council of Stevens Institute of Technology, Hoboken, N. J., has announced a campaign to raise money for the rehabilitation of historic Castle Stevens on the campus overlooking the Hudson River at Castle Point, and for other buildings.

The University of Illinois is planning a safety department for supervision, instruction and research in all departments of safety controls, such as traffic, health, fire and water. The university will co-ordinate all safety measures on the Champaign-Urbana, Galesburg and Navy Pier (Chicago) campuses under a Department of Safety. Research would be in the departments of civil and mechanical engineering.

The enrollment in engineering colleges indicates a rapid readjustment back to pre-war trends, according to an analysis made by S. C. Hollister, dean of engineering at Cornell University. Figures collected by the American Society for Engineering Education show a freshmen enrollment this year of 48,000 in engineering, representing a sharp decline from the figure of over 80,000 in 1946.

The school of engineering at the University of Kansas expects personnel representatives from at least 50 companies to interview seniors between now and June. This will be an increase over last year, and a sign that the demand for college-trained men has not eased.

Bureau of Reclamation officials estimate that there will be room for some 400 student engineers on reclamation projects throughout the 17 western states to help drive forward the large construction program now under way and in the planning stage. These men will be needed for from 60 to 90 days during June to September. The greatest need is for civil engineers, but there will be openings for electrical, mechanical and other student engineers for practical, on-the-job engineering experience.



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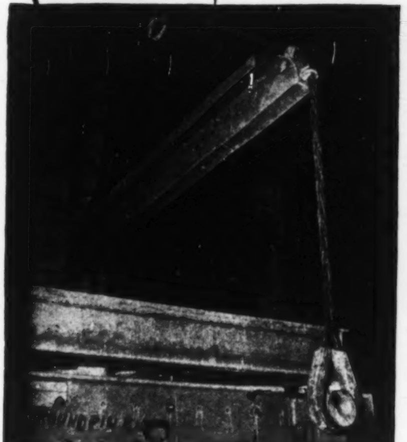

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SUPER-Harbord PLYCRETE—Grade-marked: EXT • DFPA • AA. For multiple re-use form work. Hot-press-bonded with phenol-type resin adhesive. ALL veneer jointed. All open defects in crossbands repaired. Rehumidified after pressing. Sanded smooth both sides. Edge-sealing and oiling optional.

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Harbor PLYFORM—Grade-marked: PLYFORM • DFPA • BB. Bonded with water-resistant 10-cycle glues (not waterproof). Both faces are BB (solid) veneer, free from open defects. Sanded smooth. Factory edge-sealing and oiling optional.

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OBITUARY

William von Phul, 77, retired president of Ford, Bacon & Davis, engineers, died in Larchmont, N. Y., April 17. A graduate of Tulane University, 1891, he joined Ford, Bacon & Davis in 1905 becoming a partner seven years later. He had charge of reconstruction of street railways in San Francisco after the earthquake of 1906. He also directed construction and operation of utility and street railway systems in New Orleans, San Francisco, Memphis and Nashville, Tenn.; Birmingham, Ala.; Little Rock and Pine Bluff, Ark.; Houston, Tex. From 1916 to 1919 Mr. von Phul was vice-president and general manager of United Railroads of San Francisco, becoming president in the latter year. He was also president and general manager of the Market Street Railways in San Francisco from 1919 to 1922, when he became president of Ford, Bacon & Davis. He retired in 1944.

Lawrence V. Pollock, 50, chief engineer for the Birmingham, Ala., Water Works Co., died April 8. He was a graduate of Washington and Jefferson College, and had been associated with water companies for the last twenty years.

Lewis R. Ferguson, 69, civil engineer and a pioneer in concrete construction, died recently in Dallas, Tex. A graduate of the University of Pennsylvania, he took an active part in the creation of the Portland Cement Association, serving as its chief engineer and assistant secretary. He was engineer with the Pennsylvania Railway during construction of the tunnels under the East River in N. Y. City, and he originated and built the first concrete ships during the first world war. He joined the Lone Star Cement Corp. nearly a quarter of a century ago and rose to vice-president, retiring three years ago.

Lester W. McGowan, 68, of Sarasota, Fla., died in Jacksonville, Fla., April 2. A civil engineer, he helped with the Lake Okeechobee dyke and other Florida projects.

W. A. Rosenberger, 63, a retired consulting engineer from Hagerstown, Md., died at Orlando, Fla., April 2. He was a graduate of the University of Zurich, Switzerland.

Charles William Frick, 67, civil engineer, of Arlington, Va., died April 7 at Bethesda Naval Hospital, Maryland.

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Mr. Frick joined the Army Engineer Corps and took part in the Spanish American war. Following the Philippine campaign, he worked for some time on the islands with a private engineering firm. Later he was with an irrigation company in Texas.

Bruno J. Mathews, 68, highway commissioner of Kankakee, Ill., since 1935, and former member of the local park district and the county board of supervisors, died April 13.

Thomas Rafter, 69, superintendent of construction for the Hudson Bay R. R., died at Edmonton, Alta., April 4.

Frank Hugh Cotterall Sefton, 59, chief engineer for the Toronto Transportation Commission's rapid transit project, died April 5. A graduate of the University of Toronto, he was a veteran of both the first and second world wars.

Walter F. Welsh, 57, civil engineer for the Bigelow Liptak Firebrick Co., Detroit, Mich., died in Daytona Beach, Fla., recently.

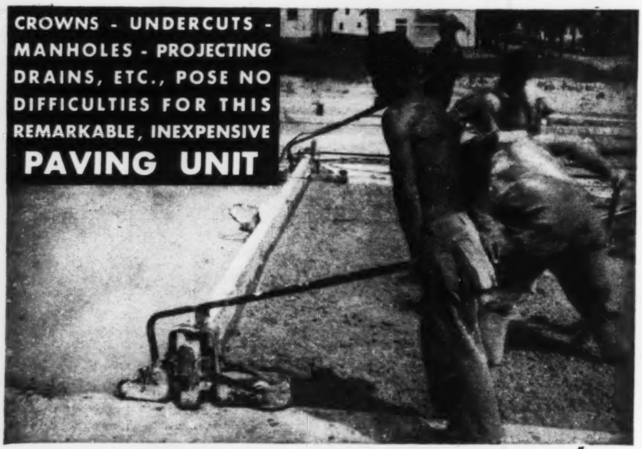
Harry H. Peters, 71, retired civil engineer, died April 5 in Columbus, Ohio. He was formerly with the U. S. Army Engineers.

Richard W. Judd, 65, an engineer with the Washington state highway department for 25 years, died April 9 at Olympia. He attended the University of Wisconsin engineering school and had lived in Washington state since 1906. He specialized in the development of oiled roads.

Eugene H. Sawin, 72, an engineer with the Army Corps of Engineers at Kansas City, Mo., for seven years before he retired two years ago, died there April 7. Earlier for 18 years he had been chief draftsman for E. T. Archer & Co., consulting engineers, Kansas City.

James F. Seiler, 64, expert on wood construction and bridge design for the American Wood Preservers Ass'n., in Washington, D. C., died there recently. For eight years he had been bridge engineer for the Wyoming highway department.

William S. P. Robins, 62, civil engineer, died at Shawnee, Kan., April 15. For 35 years, before his retirement three years ago, he was chief draftsman for the Kansas City Terminal Railway. He was a graduate of Purdue University.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Proposed Work—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

WATER SUPPLY

Ark., Weiner—City, WW and sanitary sewerage sys., **$148,000.** Layman Eng. Co., Jonesboro, consult. engr.

Ark., Wynne—City, voted bonds, imprv. water sys. **$125,000.**

Calif., Brawley—City, voted **$750,000** bonds, water sys. imprvs., incl. storage reservoir, treatment plant imprvs., etc. Quinton Engineers, Ltd., 816 S. Figueroa St., Los Angeles, consult. engr. CD 9/7—ENR 9/16.

Calif., Healdsburg—City, City Hall, voted **$210,000** bonds, watermains and reservoir. Walter Adams, City Hall, city engr. CD 2/28.

●**Calif., Pasadena**—City, 50 m.g. rein.-con. reservoir 474 ft. wide, 575 ft. long, and 27 ft. water depth. **$1,400,000.** James M. Montgomery, 117 E. Colorado St., consult. engr.

Calif., Ventura—Bd. Supervs. Ventura Co., Ventura, 26 in pipeline, Matilija to Tico Rds., **$358,000;** 12 in. pipeline Miners Oaks to Ventura Ave., **$148,000;** 18 in. pipeline Tico Rd. to Lomita Ave., **$25,000;** Miner Oak to Aliso Foothill Rd., **$81,000;** 14 in. pipeline Aliso St. to Grand Ave., **$96,000.** Harold B. Conkling, consult. engr.

N. M., Soccorro—Town, plans by W. Caros Powell, engr. and archt., Soccorro, water sys. imprvs. **$290,000.** CD 11/10—ENR 12/9.

O., Toledo—City, George Van Dorp, water comr., Toledo, 13,000 lin. ft. 36 in. pressure pipe for water distr. sys. serving southeast Toledo. **$500,000.** Owen Clark, Cherry St., city water engr

Tex., Alpine—City, John Gillett, mayor, voted bonds, c.i. water distr. lines, **$80,000;** Northside water supply well, **$50,000.** John Stovell, c/o owner, engr CD 3/18.

●**Tex., Sweetwater**—City, c/o Mayor, Sweetwater, voted bonds, dam and reservoir on Oak Creek and 30 mi. connecting pipeline, **$2,500,000.** Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs. CD 12/17—ENR 1/7.

Tex., Waxahachie—City, D. E. Clift, mayor, voted **$675,000** bonds, WW sys. imprvs., enlargements. T. C. Forrest, Jr., Praetorian Bldg., Dallas, consult. engr. CD 9/2—ENR 9/16.

Utah, Logan—City, H. R. Pedersen, recdr., WW imprvs., incl. 2 m. g. rein.-conc. reservoir and 16,000 ft. new supply line pipe, **$370,000;** imprv. municipal hydro-electric plant, **$60,000.** Ray Hugie, city engr.

Wyo., Cody—City, WW imprvs., incl. addnl. watermains, rebuild and lower some existing mains, construct city water filtration svs. **$130,000.**

Wyo., Lander—City, defeated bonds, water sys. imprvs. **$267,000.** George C. Reis, Lander, engr. and archt. CD 3/4.

SEWERS, WASTE DISPOSAL

Calif., Los Angeles—City Bd. P. Wks., 153 City Hall, 8- to 12-in. sanitary sewers and resurf. in Oxnard St. and Colfax Ave. Sewer Dist., **$194,236.** Lloyd Aldrich, city engr.

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, sanitary sewers, Marengo Ave., etc., Altadena, **$159,500;** sanitary sewers Antwerp Ave., etc., Willowbrook, **$78,400.** C. E. Arnold, coe. engr. and surv.

Colo., Denver—City and Denver Co., Dpt. Imprvts. & Parks, T. P. Campbell, mgr., City and County Bldg., North Side Storm Sewer Dist. 4. **$171,400.** Terry Owens, city engr.

Ind., Indianapolis—Bd. Sanitary Comrs., City Hall, and Bd. P. Wks., storm relief sewers, York St., Kentucky Ave. to White River, **$140,000.** M. G. Johnson, city engr. CD 7/22/43.

La., Donaldsville—Ascension Parish, Donaldsville, voted $205,000 bonds, drainage work, **$625,000.** CD 2/11—ENR 3/3.

Okla., Enid—City, sewage disposal plant. **$200,000.** L. T. McGee, Enid, engr.

Tex., San Antonio—Billy Mitchell Village, Inc., c/o Arthur E. Baird, San Pedro Ave., sanitary sewers and drainage, incl. disposal plant and large main. **$225,000.** Frank T. Drought, 117 W. Pecan St., cosult. engr.

Tex., Waxahachie—City, D. E. Clift, mayor, voted **$575,000** bonds, sanitary sewerage sys. imprvs., expan., for lines and treatment plant. T. C. Forrest, Jr., Praetorian Bldg., Dallas, consult. engr. CD 5/23/46—ENR 6/13/46.

Wyo., Lander—State of Wyoming, Lander, sewage disposal plant, employees living quarters and boys dormitory. **$370,000.**

Man., Flin Flon—Municipality, sewerage sys. **$500,000.** W. Venerables, Flin Flon, engr.

Ont., Port Arthur—City, A. H. Evans, clk., City Hall, 32 ton mono hearth incinerator, chimney 668 ft. high, Approx. **$125,000.** S. E. Flook, c/o owner, and Francis Hankin Co. Ltd., 57 Bloor St., W., Toronto, engrs. CD 4/1—ENR 4/15.

BRIDGES

Calif., Crescent City—A. C. Dutton, Lumber Co., c/o W. Speer, atty., 918 2 St., wharf consisting of 1000 ft. causeway, topped with 30 ft. concrete road, **$250,000.**

●**Minn., Hastings**—Chicago, Milwaukee, St. Paul & Pacific Railroad Co., M. L. Madill, ch. engr. (Eastern Lines) Savanna, Ill., lift span railroad bridge over Mississippi River, **$1,500,000.**

●**Pennsylvania**—Delaware River Joint Toll Bridge Comn., Trenton, N. J.,

Northampton Co.—construct approach to toll bridge over Delaware River in city of Easton, **$3,000,000.** Greiner Eng. Co., 1201 St. Paul St., Baltimore, Md., consult. engr. CD 9/18/47—ENR 10/1/47.

Virginia—State Hy. Dpt., Richmond,

Fredericksburg District

Essex Co.—wid'n curb, gutter, raising approaches Hoskins Creek, east Tappahannock, Tappahannock, Hoskins Creek, **$90,000.**

raising fills above highwater at Mount Landing Creek, Brockenborough and Piscataway Creek, **$18,000.**

Middlesex Co.—reconstruction narrow and inadequate road and bridge, Blakes Gate, west, **$33,000.**

Lynchburg District

Campbell Co.—supplementing previous allocation reconstruction weak Southern Railway overpass and approaches south of Lynchburg, **$63,000.**

Nelson Co.—strengthen and wid'n two weak and narrow bridges over south and north forks, Tye River, between Tyro and Montebello, **$10,000.**

Richmond District

Chesterfield Co.—Nuttree Creek revision relocation accident prone narrow bridge and approach curves, **$125,000.**

Goochland and Powhatan Counties—aproaches to James River Bridge, at Maidens, **$12,000.**

Henrico and Chesterfield Counties—approaches to Westham Bridge, relocation canal, **$250,000.**

Petersburg—repairs to Appomattox River Bridge, **$25,000.**

Richmond—approaches to Westham Bridge, **$20,000.**

widen Atlantic Coast Line Railway Belt Line overpass on Cary St., **$25,000.**

remodel Richmond-Fredericksburg and Potomac Railroad overpass and south approaches, Boulevard Bridge, **$55,000.**

Que., Montreal—Canadian Pacific Ry Co., J. E. Armstrong, ch. engr., Windsor Station, and Municipality, subway under railway tracks, Cavendish Blvd., south of Benny Farm development. **$300,000.**

Que., Montreal—Dominion Govt., Ottawa, Ont., conversion of Victoria Bridge, **$200,000** voted.

STREETS AND ROADS

†**N. M., Albuquerque**—U. S. Eng., P. O. Box 1538, roads and drainage structure, incl. 3,110 cu. yd. excav., 17,140 sq. yd. subgrade preparation; 2,830 cu. yd. grav. base course; 4,260 gal. prime coat, etc. ENG.-29-005-49-70.

N. Y., New York—President Manhattan Boro, Municipal Bldg., Zone 7, grading, regrading, curbing, recurbing, laying, re-laying sidewalks, asph. paving and repaving Avenue D. from 1. 6 to E. 13 Sts.; E. 10 St. from Avenue D to Franklin D. Roosevelt Dr.; curbing, recurbing westerly side of Franklin D. Roosevelt Dr. from E. 10 to former northerly line of E. 13 St. **$100,000.**

N. D. Fargo—City, new pavement, various repairs to old pavement, curbing, widening and paving streets. **$250,000.** W. P. Tarbell, city engr.

Okla., Ada—City, voted bonds urban highway right of way, **$200,000.** George S. Toler, Ada, consult. engr.

Pennsylvania—State Hy. Dpt., Harrisburg,

Armstrong Co.—3 span bridge carrying State Hy. Rt. 156 over relocated tracks of the Pennsylvania R R. near Avonmore in Kiskiminetas Twp., **$170,000.**

●**Tex., Canton**—Van Zandt Co., Leon Cox, judge, Courthouse, voted bonds all weather road constr. approx. 60 mi. Precinct 1, **$700,000;** approx. 45 mi. Precinct 2, **$600,000;** approx. 45 mi. Precinct 3, **$600,000;** approx. 50 mi. Precinct 4, **$600,000.** CD 3/18.

Virgina—State Hy. Dpt., Richmond,

Fredericksburg District

Caroline and Essex Counties—spot resurf. weak sections, Spotsylvania Co. line, **$127,269.**

King George Co.—sidewalk extens., from King George Court House, to King George Co. high school, **$8,000.**

heavy duty concrete surf. 30 mi. road between Bowling Green and Morgantown Bridge, Port Royal east, **$400,000.**

bit. Potomac River south, **$10,000.**

King and Queen and Gloucester Counties—bit., Schacklefords Fork-Adner, **$32,000.**

King William Co.—bit., Hanover Co. line, east, **$35,000.**

Lancaster Co.—curb and gutter, Lancaster Court House, **$5,000.**

bit. surf. West Lively-Richmond Co. line, **$30,000.**

imprv. intersection, White Stone, Alternate 3, easing, curves and imprvs. Rt. 3, from Chinns Mill, east, **$44,000.**

Mathews Co. — sidewalks, etc., Mathews Court House west, **$36,000.**

bit. intersection Rt. 14, west, **$75,000.**

Mathews and Gloucester Counties—bit., East Gloucester, Court House, **$70,000.**

Middlesex Co.—bit., Rt. 227, Cooks Corner, Saluda, **$14,000.**

bit. intersection Rt. 33, Cooks Corner, Urbana, **$18,000.**

Northumberland Co.—curb, gutter, wid'n Heathsville, **$45,000.**

relocating inadequate road, Heathsville, east, **$60,000.**

curb, gutter Village Callao, **$14,585.**

Spotsylvania Co.—Orange Co. line south, **$20,638.**

Stafford Co.—connection between north and southbound lanes, Stafford Wayside, **$8,000.**

Westmoreland Co. — wid'n, curb, butter, Montross, **$35,000.**

curb, gutter, Colonial and Beach, **$18,000.**

Lynchburg District

Amherst Co.—connection between north end Lynchburg expressway and Rt. 29 at Madison Heights, Lynchburg, north, **$300,062.**

Amherst and Nelson Counties—bit., between north of Amherst and Colleen, **$50,000.**

Appomattox Co.—wid'n roads, beginning at Appomattox and exten. west towards Lynchburg, Intersection Rt. 24, (Appomattox), west, **$165,000.**

Buckingham Co. — sidewalk, curb, gutter, wid'n., Buckingham Court House, **$80,000.**

Campbell Co.—exten. reconstruction and relocation narrow and crooked road south of Lynchburg, South Rt. 24, south, **$300,000.**

Cumberland Co.—correct inadequate sight distance and weak surf. Intersection Rt. 45, west, **$75,000.**

Danville—bit. West Main St., **$12,000.**

Halifax Co.—bit., West intersection Rt. 501, west, **$125,000.**

wid'n., curb, gutter, sidewalks, town of Halifax, **$132,000.**

Lynchburg — starting Citys Expressway, **$134,500.**

Pittsylvania Co.—curb, butter, wid'n Chatham, **$35,000.**

relocation present crooked road west of Danville, Intersection Rt. 125, **$225,000.**

reconstruction Milton Rd., Intersection Rt. 58 north, **$160,000.**

Prince Edward Co. — wid'n, strengthening present surf. treated soil road, Intersection Rt. 307, west, **$138,000.**

reconstruction resurf. weak road between Farmville and Keysville, South Kingsville, south, **$150,000.**

Richmond District

Chesterfield Co.—wid'n curb, gutter sidewalk, Village, Maroaca, **$40,000.**

traffic circle, heavily traveled intersections, Int. Rt. 161 near west corporate limits, Richmond, **$85,000.**

Hanover Co.—bit., Caroline Co. line south, **$25,000.**

wid'n. curb and gutter sections Ashland, between Rd. 1 and Richmond, Fredericksburg and Potomac Railroad, Int. Rt. 1 (Ashland) west, **$65,000.**

Henrico Co.—spot bit. resurf. weak sections, Richmond, west, **$48,000.**

Henrico and Charles City Counties—reconstruction narrow and crooked road, Richmond, east, **$140,000.**

Henrico and Goochland Counties — road strengthening, road from Richmond, west, West Richmond, **$175,420.**

Lunenburg Co.—wid'n, curb, gutter, sidewalk, town Kenbridge, **$8,000.**

Mecklenburg—bit., South Hill, **$18,000.**

bit., Chale City, **$35,000.**

exten. heavy duty road between Rt. 1 and Clarksville, West Rt. 1, west, **$400,000.**

New Kent Co.—completion gap, dual highway, between Bottoms Bridge and Toano cut-off, East Providence Forge-east, **$115,000.**

completion gap dual highway between Bottoms Bridge and Toano cut-off, Bottoms Bridge east, **$24,000.**

Nottoway Co.—curb, gutter, wid'n. Crewe, **$35,000.**

curb, gutter, wid'n Blackstone, **$38,000.**

Powhatan Co.—bit. Cumberland Co. line, east, **$70,000.**

Prince George Co.—imprv. road between Hopewell and Rt. 301, Int. Rt. 106, **$180,000.**

Richmond—resurf. reconstruction Hyll St. south, **$40,000.**

reconstruction Chamberlayne Ave., **$50,000.**

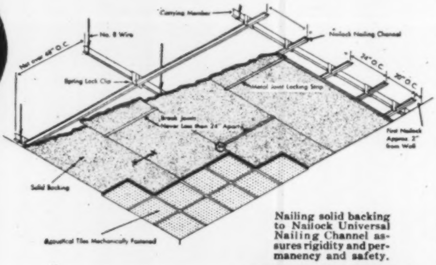
British Columbia and Yukon Territory—British Columbia Provincial Govt—Dominion Govt., Parliament Bldgs., Victoria, B. C.,

Atlin to Jakes Corner—Constructing 58 mi. road connecting Atlin, B. C., with Jakes Corner, Yukon Territory, **$450,000.** H. C. Anderson, Parliament Bldgs., Victoria, B. C., engr.

EARTHWORK, WATERWAYS

●**Man., Winnipeg** — Municipality, removing 8 mi. Lister Rapid rock formation, Red River, exten. from Middle Church to Lockport, **$20,000,000.** W. D. Hurst, city engr.

Ont., Toronto—Municipality, 2 mi. breakwater, from Eastern Gap to Coatsworth Cut. **$100,000.**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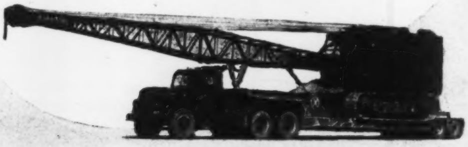

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AIRPORTS AND AIRBASES

Ill., Carlyle—AIRPORT ENLARGEMENT—Illinois Dpt. Aeronautics, Norman B. Bird, ch. engr., Springfield, imprv., enlarging Class I municipal airport. **$170,600.**

Pa., Franklin—AIRPORT—Chess Lamberton Memorial Airport, Franklin, constructing bldgs., preparation of site, paving runways, taxiways and aprons. **$419,400.** A. H. Wessell, Harrisburg State Airport, New Cumberland, CAA Dist. Airport Engr. CD 7/14—ENR 7/22.

Wis., Wausau — ADMINISTRATION BLDG. — City, plans by Foster & Yasko, 407 Scott St., 2 story, bsmnt., 40x100 ft, steel, concrete block administration bldg. at airport. **$200,000.** CD 1/15/47—ENR 2/6/47.

Que., Burnt Creek — AIRPORT — Hollinger North Shore Mining & Exploration Co. Ltd., 360 St. James St., Montreal, airport, **$150,000.**

LATIN AMERICA

Mexico—Mexican Federal Govt., c/o Petroleum Admin. of Pub. Wks. Dpt., Mexico City, plans refinery plants at Salamanca, **$12,000,000;** Monterrey, **$8,500,000;** Sadina Crux, **$10,000,000.**

Mexico, Ciudad Tonala—Federacion de Cooperativas Pesqueras de Chiapas (Chiapas Fishers Co-operatives Federation) Tuxtla Gutierrez, Chiapas, plans 50 bed hospital for co-operatives members. **$300,000.**

Mexico, Golima—D. G. de P. C. R., Plaza de la Republica, 6, Mexico, D. F., plans 300 model homes for government employees. **$300,000.**

Mexico, Mexico City—Francisco Aguirre, Victoria, 70, Mexico, D. F., plans radio receiving sets factory. **$250,000.**

Mexico, Mexico City—Mexican Govt., Sria. de B.N., Mexico, D.F., plans 6 story building for Labor Ministry. **$500,000.**

Santo Domingo — Dominican Republic, Trujillo City, plans memorial bldg. to Christopher Columbus. **$7,000,000.**

PUBLIC BUILDINGS

Ark., North Little Rock—City, plans by Bruggeman, Swaim & Allen, Malco Bldg., municipal bldg. **$250,000.**

Calif., Arcata—Arcata Union High School Dist., Arcata, **$450,000,** bond election May 20, gymnasium and shop. Masten & Hurd, 526 Powell St., San Francisco, archts. CD 6/4/45—ENR 6/14/45.

Calif., Avenal—Avenal Hospital Dist., Avenal, voted **$390,000** bonds, 1 story, 23-bed hospital. CD 2/25.

●**Calif., Berkeley**—Bd. Regents University of California, Berkeley, student union bldg., (war memorial bldg.) incl. auditorium, theatre, etc. **$5,000,000.**

Calif., Covina — Covina City Elementary School Dist., Covina, voted bonds, classroom bldg., cafeteria, garage, Barrance St. **$250,000.**

●**Calif., Culver City** — Culver City High School Dist., Culver City, voted bonds high school, **$1,900,003.** Daniel, Mann, Johnson, 672 S. La Fayette Park Pl., Los Angeles, archts. CD 4/6/48—ENR 4/22/48.

Calif., Inglewood—Centinela Valley Union High School Dist., Inglewood, plans by H. L. Gogerty, 3123 W. 8 St., Los Angeles, 1,000 seat rein.-con. school auditorium at Inglewood High School. Approx. **$250,000.** CD 12/4/46—ENR 12/12/46.

Calif., Lawndale — Lawndale Elementary School Dist., Lawndale, plans by H. L. Gogerty, 3123 W. 8 St., Los Angeles, Lawndale Elementary and Intermediate School incl. 6 classrooms, and administration bldg. Approx. **$250,000.**

●**Calif., Ontario** — Ontario Elementary School Dist., Ontario, voted bonds schools. **$1,000,000.** CD 10/17/47—ENR 10/30/47.

Calif., Redondo Beach—Bd. Supervs. Los Angeles Co., 501 Hall of Records, Los Angeles, plans by Austin, Field & Fry, Chamber of Commerce Bldg., Los Angeles, life guard station and administration bldg. **$109,000.**

●**Calif., San Rafael**—Marion County Hospital Dist., Courthouse, $800,000 bond election May 24, 100 bed hospital, **$2,076,000.** Robert Stanton, Box 2177, Carmel, archt. CD 10/8/47—ENR 10/16/47

Colo., Grand Junction—School Dist. 1, Grand Junction, voted **$400,000** bonds, 6 classroom Tope School addn., and 8 room Columbus School addn. Atchison & Kloverstrom, 1275 Monaco Parkway, Denver, engrs and archts. CD 2/25—ENR 3/17.

Conn., Manchester—Town, Bd. Educ., Manchester, brick, steel Hollister Street School addns., alterations, **$250,000;** brick, steel school, Broad St. Section, **$250,000.**

+**Conn., Newington**—Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash., 25, D. C., 125 bed brick, steel concrete hospital addn., Newington Veterans Hospital, Approx. **$250,000.**

Conn., Vernon—Town Citizens Com., Town Hall, 2 story, bsmnt., brick, steel school, East St., **$300,000;** brick, steel school, Rural Dist., **$250,000.**

●**Conn., Wallingford** — Boro Electric Dpt., Wallingford, brick, steel, concrete steam power plant and generating station, Washington St. **$3,500,000.** Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City 2, Mo., consult. engrs. CD 3/28.

Ga., Atlanta — City Bd. Educ., City Hall, plans by Shutze & Armistead, Candler Bldg., Atlanta, Henry Grady High School addn. **$400,000.**

Idaho, Blackfoot — State, Boise, patients bldg., State Hospital South, **$624,000.** CD 7/3/46—ENR 8/8/46.

Idaho, Rupert—School Bd., concrete high school, **$750,000.**

Ill., East St. Louis—Bd. Educ., School Dist. 189 of St. Clair Co., J. H. Steuernagel, secy., 240 N. 6 St., plans by Saunders & Johnson Associated Architects, Murphy Bldg., alterations and gymnasium, shower room addn. to Senior High School, Tenth St. and Ohio Ave. **$500,000.** CD 3/26/47—ENR 4/17/47.

Ill., Riverside—Riverside Bd. Educ., Riverside, plans by McFadzean Everly Rose & Assoc., 874 Green Bay Rd., Winnetka, school. **$300,000.** CD 4/11/46.

●**Ill., Urbana**—University of Illinois, Urbana, plans by Holabird, Root & Burgee, 180 N. Wabash St., Chicago and Ernest Stouffer for University of Illinois 3 story, bsmnt., brick, stone research hospital addn., **$8,000,000.** CD 4/13/45—ENR 5/3/45.

Ind., Fort Wayne—Bd. School Trustees, 1230 S. Clinton St., plans by Fred Pohlmeyer, 402 W. Main St., 2 story, 192x219 ft., brick, rein.-con. M. J. Abbett School, Smith and Senate Sts. **$450,000.**

Ind., Ft. Wayne—Comrs. Allen Co., Court House, 2 story, bsmnt., T shaped patient bldg., Irene Byron Sanatorium, **$400,000.**

Ind., Indianapolis—Bd. Sanitary Comrs., City Hall, plans by O. A. Tislow, 618 Architects and Builders Bldg., 1 story, 150x322 ft. masonry, steel, rein.-con. parking garage, 2700 S. Belmont St. **$250,000.** CD 2/7—ENR 3/17.

Ind., Indianapolis—Bd. School Comrs., M. V. Bailey, bus. dir., 150 N. Meridian St., plans by McGuire & Shook, 1400-01 Fletcher Trust Bldg., 2 story bsmnt., brick school, 401 N. Arlington Ave. **$250,000.** CD 3/17—ENR 3/31.

Ia., Cedar Rapids—Independent School Dist., Cedar Rapids, plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Ill., school. **$500,000.**

Ia., Denison—Crawford Co., Denison, plans by Wm. Buettler, Insurance Exchange Bldg., Sioux City, 2 story, part bsmnt. memorial hospital. **$535,000.** CD 7/30—ENR 8/19.

Ia., Sioux City — Bd. Educ., 1221 Pierce St., plans by Wm. Beuttler, 405 Insurance Exchange Bldg., gymnasium, 12 and Jackson Sts. **$700,000.** CD 10/14—ENR 10/28.

Ia., Storm Lake—Buena Vista Co., Storm Lake, plans by Wm. Buettler, Insurance Exchange Bldg., Sioux City, 3 story part bsmnt. hospital, **$540,000.** CD 6/18—ENR 7/7.

Ia., Vinton—Bd. Educ., Vinton, high school. **$600,000.**

Ia., Webster City—Hamilton Co., Webster City, voted $125,000 bonds, county hospital, **$300,000.**

Kan., Chanute — City, City Hall, plans by T. W. Williamson & Co., National Bank of Topeka Bldg., Topeka, hospital, **$400,000.** CD 9/21—ENR 10/28.

Kan., Leavenworth — Bd. Educ., Leavenworth, elementary school, South Leavenworth, **$275,000.**

Ky., Bowling Green—Bd. Educ., Center St., plans by Lester W. Routte, Vincennes, Ind., 1 story, bsmnt., brick high school gymnasium, **$300,000.**

Ky., Independence—Kenton Co. Bd. Educ., J. A. Caywood, Independence, plans by H. R. Elliston, Second National Bank Bldg., Cincinnati, O., 2 story, bsmnt., brick school, **$330,000.** Bromley, Hanley & Young, 123 E. 6 St., Cincinnati, O., structural engrs.

La., Jena—LaSalle Parish School Bd., Jena, plans by Barron & Heinberg, Guaranty Bank Bldg., Alexandria, Ward 2 High School. Approx. $250,000.

La., Lafayette—Lafayette Parish Bd. Educ., J. C. Landry, supt., Lafayette, high school, north of Southern Pacific Ry. tracks, **$400,000.**

Mass., Amesbury—Town of Amesbury Housing Auth. N. E. Olsson, secy., 10 School St., plans by Melvin F. Combs, 56 Central Ave., Lynn, 27 unit veterans housing, Macy St. Approx. **$274,500.** Otis W. McIntosh, 16 Harwood St., Lynn, engr. CD 12/1—ENR 1/6.

Mass., Peabody—City, Supt. Schools, Peabody, plans by John M. Gray Co., 175 High St., Boston, school, Brown St., South Peabody. Over **$250,000.** CD 7/12/46—ENR 8/8/46.

●**Mass., Revere** — City of Revere Housing Auth., Police Station, Pleasant St., plans by Parker J. Brown, 18 Tremont St., Boston, 120 unit veterans housing development, Cushman Ave. **$1,300,000.** CD 9/28—ENR 10/14.

Mass., Raynham—Town, Wm. A. Rogers, supt. Schools, brick school. **$250,000.**

●**Mass., Roxbury** — Childrens Hospital, 300 Longwood Ave., 12 story childrens medical center, **$7,000,000;** 7 story, bsmnt., wing between isolation and bader bldgs., Longwood Ave., **$825,000.** Stone & Webster Eng. Corp., 49 Federal St., Boston, engrs.

Mass., Sutton—Town School Dpt., Town Hall, plans by Franklyn R. Williams, 20 Elm St., Worcester, 2 story, bsmnt., 61x158 ft. high school, **$300,000.** CD 2/21/46.

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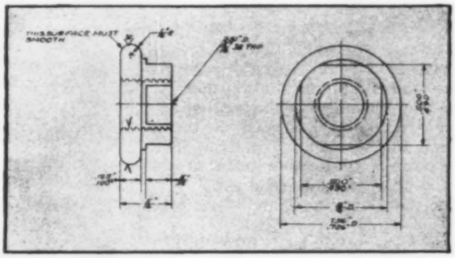

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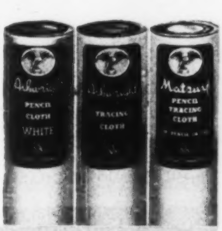

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Mich., Allen Park (Br. Dearborn)—Allen Park School Bd., 7445 Allen Rd., school and school addn. **$300,000.**

●**Minn., South St. Paul**—Bd. Educ., I. T. Simley, supt., South St. Paul, voted **$1,750,000** bonds, 2 story, bsmnt., 580x777 ft. high school, schools, etc. CD 3/3—ENR 3/17.

Miss., Tupelo—Community Hospital, Tupelo, hospital addn. **$300,000.**

Mo., St. Louis—City, and Wohl Foundation, c/o M. M. Kinsey, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., Zone 3, plans by Jamieson & Spearl, 1696 Arcade Bldg., 812 Olive St., Zone 1, 2 story, bsmnt, stone, concrete public health centers, one at 13 and Wyoming Sts., other at Aldine Pl. on N. Kingshighway Blvd., **$930,000.** CD 4/26/43—ENR 5/6/43.

Neb., Beatrice—Bd. Educ., Beatrice, plans by J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., high school. **$300,000.**

Neb., Benkelman—Bd. Educ., Benkelman, plans by Davis & Wilson, 225 Stuart Bldg., Lincoln, high school. **$300,000.**

Neb., Crete—City, hospital. **$286,666.**

†**Neb., Omaha**—Ninth Naval Dist., Great Lakes, Ill., 100 housing units for enlisted personnel of Navy, at Fort Omaha.

Neb., Seward—Seward Co., Seward, hospital. **$285,000.**

●**N. J., Trenton**—State Hy. Dpt., State House Annex, plans by Micklewright & Mountford, 72 Ewing St., state hy. office, Ewing Twp. **$1,500,000.** CD 3/25.

●**N. Y., Oyster Bay**—Union Free School Dist. 21, Oyster Bay, school on 21 acre tract on Broadway in Bethpage Sect. **$1,400,000.** CD 9/10/45—ENR 9/20/45.

N. C., Edenton—Chowan Co. Hospital, J. W. Davis, chn. Bd., Edenton, 35-bed hospital, Virginia Rd. **$350,000.**

N. C., Fairmount—Bd. Comrs. Robeson Co. D. G. Kinlaw, clk., Lumberton, school, **$295,000.** $3,000,000 bonds voted for schools. CD 3/4—ENR 3/17.

N. C., Warrenton—Warren Co. Hospital, A. L. Capps, chn. Bldg. Comn., plans by John Rowland, 330 N. Queen St., Kinston, 35 bed hospital. Approx. **$250,000.**

N. D., Mandan—State Bd. Admin., Bismarck, plans by Ritterbush Bros., Bismarck, boys dormitory at State Training School. **$250,000.**

●**O., Dover** — Cities of New Philadelphia and Dover and Inscanawas Co., plans by Charles J. Marr, Ray Ave., N.W. New Phila., 100 bed hospital addn. **$1,000,000.**

O., Geneva—City, Geneva Memorial Hospital, W. Main St. **$325,000.**

O., Hamilton—Bd. Educ., H. H. Howard, bus. mgr., 332 Dayton St., plans by Outcalt, Guenther & Assoc., 3124 Shaker Square, Cleveland, 2 story, part bsmnt. Jefferson Tyler School. **$750,000.** CD 1/3/47—ENR 1/23/47.

O., Hamilton—Bd. Comrs. Butler Co. and Hospital Bd. Trustees, 3 and High Sts., plans by Samuel Hannaford & Sons, Dixie Terminal Bldg., Cincinnati, 3 and 4 story concrete, brick, stone hospital. **$500,000.**

O., Norwood (Br. Cincinnati)—Town, Bd. Educ., Harold Bates, supt., Administration Bldg., Williams Ave., plans by Charles F. Cellarius, 906 St. Paul Bldg., 111 E. 4 St., Cincinnati, 3 story, bsmnt., concrete, brick, steel technical school (addn. to high school). **$440,000.** Fosdick & Himler, Union Trust Bldg., 4 and Walnut Sts., plumbing, heating and electrical engrs.

†**Okla., Anadarko** — Southwestern Power Admin., P.O. Drawer 1619, Tulsa, Zone 1, 66 kv electric substation. **$395,880.**

†**Okla., Fort Gibson**—Southwestern Power Admin., P.O. Drawer 1619, Tulsa, Zone 1, 66 kv electric substation. **$590,400.**

†**Okla., Lulu**—Southwestern Power Admin., P.O. Drawer 1619, Tulsa, Zone 1, substation. **$153,000.**

†**Okla., Walters** — Southwestern Power Admin., P.O. Drawer 1619, Tulsa, Zone 1, substation. **$117,210.**

†**Okla., Webber Falls**—Southwestern Power Admin., P.O. Drawer 1619, Tulsa, Zone 1, 66 kv electric substation. **$401,000.**

†**Okla., Weleetka** — Southwestern Power Admin., P.O. Drawer 1619, Tulsa, Zone 1, 66 kv electric substation. **$161,000.**

Pa., Ardmore—Lower Merion School Dist., Montgomery Ave. and Church St., plans by Savery, Scheetz & Gilmour, 1500 Walnut St., Phila., cafeteria. **$800,000.**

●**Pa., Doylestown**—Central Bucks Co. Joint School Bd., N. Broad St. and Sandy Ridge Rd., plans by Davis, Dunlap & Carver, 1717 Sansom St., Phila., Consolidated High School. **$1,250,000.** CD 11/27/46—ENR 12/12/46.

●**Pa., Marcus Hook**—Trainor-Marcus Hook Joint School Bds., Courthouse, Media., plans by George M. Ewing, Real Estate Trust Bldg., Phila., Junior-Senior High School. **$1,000,000.** CD 3/1/45—ENR 3/8/45.

Pa., Masontown—School Dist. of Masontown, Masontown, plans by Altman & Altman, 206 Derrick Ave., Union town, 1 story, brick auditorium and gymnasium. **$250,000.**

●**Pa., Penn Valley (Ardmore P.O.)**—Lower Merion Twp. School Dist., Montgomery Ave. and Church St., Ardmore, plans by Karcher & Smith, 1520 Locust St., Phila., school. **$1,000,000.** A. E. D'Ambly, Architects Bldg., Phila., engr. CD 11/18/46—ENR 11/28/46.

R. I., Pawtucket—City. Ambrose Mc Coy, mayor, City Hall, 3 story, concrete parking garage for 1,600 cars. **$250,000.**

S. D., Chamberlain—City, Chamberlain, hospital. **$329,200.**

S. D., Faulkton — Faulkton Co., Faulkton, hospital. **$300,000.**

S. D., Gregory — Gregory Co., Gregory, hospital. **$280,000.**

S. D., Redfield — Spink Co., Redfield, hospital. **$400,000.**

Tex., Austin — Austin Independent School Dist., Dr. J. E. Edgar, supt., Austin, plans by Page, Southerland & Page, 602 West Ave., brick, steel, concrete Tarrytown School, adjacent 2900 block Exposition Blvd. **$325,000.** CD 5/14/46—ENR 7/11/46.

Tex., Austin—Austin State Hospital 4110 Guadalupe St., houses for employees, physicians and new kitchen. **$300,000.**

●✝**Tex., Austin**—U. S. Govt., Internal Revenue Dpt., c/o F. B. Parsons, Asst. Col., 8 and Colorado Sts., 10 story, bsmnt., 55,000 sq. ft. masonry, stone, steel, concrete, steel U. S. Internal Revenue Office, concrete pier and beam fdn., air-conditioning. **$1,000,000.**

●**Tex., Austin**—University of Texas, c/o Bd. Regents, Austin, plans by Staub & Rather, assoc. archts., 2814 Virginia St., Houston, and Mark Lemmon consult. archt., 1210½ Main St., Dallas, 3 semi-fireproof classroom bldgs. **$3,000,000.** CD 3/24.

✝**Tex., Brownwood**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D.C., postoffice. **$610,000. FWA.**

Tex., Denton—North Texas State Teachers College, Denton, plans by George L. Dahl, 1920½ Main St., gymnasium. **$300,000.** CD 3/11—ENR 3/18/48, under LB.

✝**Tex., Denton**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D.C., postoffice. **$450,000. FWA.** CD 11/26/45—ENR 1/3/46.

Tex., Edna—Edna Independent School Dist., Edna, voted bonds addnl. school. **$250,000.** CD 3/29.

Tex., Gonzales—Gonzales Independent School Dist., Gonzales, voted bonds school. **$300,000.** H. E. Kellner, 406 Austin Hy., San Antonio, archt. CD 3/4.

Tex., Helotes—Bexar County Common School Dists., c/o Clyde Smith, 1411 Highland Blvd., San Antonio, voted bonds Mar. 26, high school Precinct 2, **$300,000.** Fred Buenz, 1517 Majestic Bldg., San Antonio, consult. archt. CD 3/17—ENR 3/31.

●**Tex., Houston**—University of Texas, c/o Bd. Regents, Austin, plans by MacKie & Kamrath, 2713 Ferndale St., and Schmidt, Garden & Erickson, 104 S. Michigan St., Chicago, Ill., cancer research **$2,000,000,** dental school **$2,000,000;** plans by R. L. White, c/o owner, university archt., preceptorial training center **$1,150,000,** public health school **$1,100,000;** plans by MacKie & Kamrath, 2713 Ferndale St., Negro Medical and Dental School **$750,000,** for Texas Medical Center, M.D. Anderson Hospital for Cancer Research, 2310 Baldwin St. CD 10/6—ENR 10/28.

Tex., Huntsville—Sam Houston State Teachers College, Huntsville, plans by Wirtz Calhoun & Tungate, 500 Stuart St., Houston, masonry, steel, concrete student union. **$300,000.**

Tex., Iran and Sheffield—Sheffield Independent School Dist., c/o C. B. Browning, Sheffield, plans by Buford & Feinberg, 1801 San Jacinto St., Dallas, school. **$350,000.**

✝**Tex., Midland**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D.C., postoffice exten., remodeling. **$350,000.** FWA. CD 11/26/45—ENR 1/3/46.

●**Tex., Pasadena**—City, Sam Hoover, mayor, plans by Charles S. Chase, 1309 Anita St., Houston, hospital. **$1,500,000.** CD 12/17—ENR 1/20.

●✝**Tex., San Antonio**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D.C., federal office. **$3,960,000. FWA.**

Tex., San Marcos—Southwest Texas State Teachers College, San Marcos, plans by Harvey P. Smith, National Bank Commerce Bldg., San Antonio, 4 unit concrete, hollow tile, Austin limestone mens' dormitory, **$500,000;** concrete, hollow tile, Austin limestone fine arts bldg., **$400,000.** CD 11/27/46—ENR 12/12/46.

Tex., Seminole — Bd. Educ., Ted Williams, supt., Seminole, plans by Buford & Feinberg, engrs. and archts., 1801 San Jacinto St., Dallas, school. **$275,000.**

Tex., Stamford — Stamford Independent School Dist., Stamford, school and gymnasium. **$250,000.**

Tex., Three Rivers—Three Rivers Independent School Dist., Three Rivers, voted bonds school. **$250,000.**

Utah, Farmington—Davis County School Bd., Farmington, **$920,000** bond election Apr. 19, schools at Bountiful and Clearfield, and imprv. Davis County High School at Kayesville. CD 5/27/48—ENR 6/10/48.

●**Wash., Bellingham**—School Bd., Bellingham, plans by G. W. Bentley, Luther Bldg., 3 schools. **$750,000** each.

Wash., Seattle—School Dist. 406, 13812, 51 Ave. S., plans by R. H. Burkhard, 15643 Maple Wild S.W., 1 story, rein.-con. school on site of old Riverton School. **$330,000.** CD 11/10—ENR 11/25.

Wash., Seattle—University of Washington, E. 45 St. and 17 Ave. N. E., Zone 5, plans by Heath, Gove & Bell, Puget Sound Bank Bldg.,

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Tacoma, University Press portion of new journalism bldg. **$250,000.** CD 2/14—ENR 3/3.

Wash., Shelton—School Bg., Shelton, concrete, brick, school. **$400,000.**

W. Va., Webster Springs — State Health Comn., c/o William J. Kreps, archt., Odd Fellows Bldg., Charleston, hospital. **$250,000.**

Wis., Kenosha—Bd. Educ., Kenosha, plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Ill., 2 story, bsmnt., McKinley Junior High School addn. **$279,000.**

●**Ont., Ajax**—Dpt. P. Wks., Parliament Bldg., Toronto, womens reformatory, north of Ajax, above Hy. 2, for Dpt. Reform Institutions. Approx. **$2,000,000.**

Ont., Port Arthur — Central Mortgage & Housing Corp., 506 Kingsington Bldg., Winnipeg., 100 houses, Transcona Div., Ray Blvd., and Marlborough Rd. Approx. **$500,000.** H. C. Spence, c/o owner, engr. CD 1/26.

●**Ont., Toronto**—Dpt. P. Wks., Parliament Bldgs., Toronto, office for Workmans Compensation Bd., headquarters for Provincial Police and auxiliary law enforcement agencies. Approx. **$2,000,000.** G. N. Williams, c/o owner, archt.

Ont., Toronto—Toronto Hydro Comn., 14 Carlton St., steam generating plant, 41 acre site in Eastern Gap area. **$500,000.**

●**Que., Mount Royal (Postal Dist. Montreal)**—High School Bd., Mount Royal, plans by R. C. Betts, 230 Lazard Ave., 2 story bsmnt., 185x544 ft. concrete, stone, brick school, Montgomery Ave. **$1,500,000.** A. L. Perry, 1502 St. Catherines St. W., Montreal, engr. CD 2/11—ENR 3/3.

COMMERCIAL BUILDINGS

●**Calif., Los Angeles**—Thomas Hull, Hollywood Roosevelt Hotel, plans by Frank Green, 1515 Chevy Chase, Glendale, Hollywood Roosevelt Hotel addn. **$2,250,000.**

Calif., Sacramento—Jacinto Development Co., 6100 14 Ave., plans by Albert W. Kahl, 18 2 Ave., San Mateo, frame shopping center, 14 Ave. and 60 St. **$250,000.** George Washington & Felix Spitzer, 204 Sacramento St., San Francisco, consult. engrs.

●**Calif., San Francisco**—Hasting College of Law, Van Ness, near McAllister, plans by Masten & Hurd, 526 Powell St., law school, **$1,250,000.**

●**Calif., San Francisco**—Twin Peaks Investment & Development Co., c/o Jack Perego, 50 Post St., plans by W. D. Peugh, 333 Montgomery St., 52 terrace-type apartments, incl. 900 units on Twin Peaks. **$5,000,000.**

Colo., Pueblo—Russ Prater, Inc., 137 N. Main St., Wichita, Kan., 48 four units each, 1 and 2 bedroom apartments.

Del., Wilmington — Congregation Beth Sholom, duPont Bldg., plans by Maurice Courtland, 2 W. 89 St., New York, N. Y., synagogue and school. **$300,000.**

Fla., Gainesville—Clarence & Philip Thomas, Gainesville, hotel, **$750,000.**

Ga., Atlanta—Sears, Roebuck & Co., Ponce de Leon Ave., plans by Shutze & Armistead, Candler Bldg., Gordon Street Retail Department Store, **$300,000.** CD 8/18—ENR 8/26.

●**Ga., Augusta**—Sisters of St. Joseph of Carondolet, c/o Kuhlke & Wade, archts., Campbell Bldg., hospital, **$700,000-$1,000,000.** CD 11/19/45—ENR 11/29/45.

Ill., Chicago—Foote, Cone & Belding, 919 N. Michigan St., plans by Harper Richards, 160 E. Superior St., 6 story office modernization, **$500,000.**

Ill., Chicago—Midland Development Co., 176 W. Adams St., 72 brick residences, Leydon Twp. **$360,000.**

Ill., Chicago—State-Madison Bldg., 2 N. State St., plans by Ralph D. Huzgagh, 6 N. Michigan Ave., altering department store, **$600,000.**

Ill., Hinsdale—Union Church, Hinsdale, plans by Benjamin Franklin Olson, 19 S. LaSalle St., Chicago, 2 chapels and parish hall. **$300,000.**

Ill., Stickney Twp. (P. O. Chicago)—J. Herbert Cline, 77 W. Washington St., Chicago, 41 houses, 87 St. and Melvina, McVickers, Meade, Moody, Austin and LaVergne Aves. **$260,000.**

Ind., Kokomo—St. Joan of Arc, Roman Catholic Church, Rev. Francis Nusett, pastor, 707 E. Harrison St., plans by Thomas Medland, 216½ 4 St., Logansport, 2 story, 50x150 ft., brick, steel church, Jay, Purdum and Harrison Sts. **$275,000.**

Ind., Logansport—Young Mens Christian Assn., Logansport, 3 story, brick, steel concrete Y. M. C. A. bldg. **$300,000.**

Ind., Marion—Marion College, Washington and 40 Sts., plans by L. W. Larimore, 203 E. Berry St., Fort Wayne, 2 story, bsmnt., brick, steel men's dormitory. Approx. **$250,000.** CD 2/27—ENR 3/11.

Ind., New Haven—Roman Catholic Church, Rev. W. J. Ehrman, pastor, 943 Powers St., plans by LeRoy Bradley, 1115 S. Clifton St., Fort Wayne, 1 story, bsmnt., 85x146 ft., brick concrete, steel parochial school, Seward and Rufus Sts. **$250,000.**

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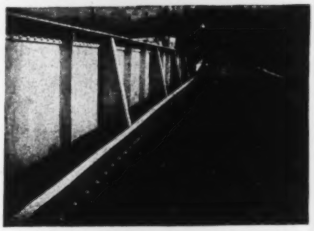

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Ky., Covington—St. Elizabeth Hospital, 21 St. and Eastern Ave., plans by Potter, Tyler, Martin & Roth, Reakirk Bldg., 128 E. 6 St., Cincinnati, O., 2 story, steel, rein-con. hospital addn. **$400,000.**

Md., Catonsville—Roosevelt Bldg. Corp., 731 Patapsco Ave., Zone 25, one 2 story, 27x27x113 ft., three 2 story, 26x27x134 ft., brick, block apartments, **$250,000.**

Minn., St. Paul—Minnesota Builders, Inc., 2064 Ford Parkway, plans by E. D. Corwin, E. 818 First National Bank Bldg., 4 brick, concrete apartments, **$300,000.**

Miss., Jackson—Young Mens Christian Assn., c/o E. L. Malvaney, archt., Millsaps Bldg., Y.M.C.A. bldg. Approx. **$250,000.**

●**Mont., Great Falls**—East Base Housing Corp., Great Falls, 246 off base housing units for military personnel. **$1,750,000.**

Mont., Great Falls—Young Womens Christian Assn., Great Falls, Y. W. C. A. bldg. **$300,000.**

Neb., O'Neill—Community Hospital Assn., O'Neill, plans by M. I. Aitken, Stuart Bldg., Lincoln, hospital. **$300,000.** CD 3/29.

N. J., Princeton—Owner, c/o Mathew C. Fleming, archt., 10 Nassau St., Princeton, housing development. Over **$400,000.**

N. J., Vineland—Sears, Roebuck & Co., Roosevelt Blvd. and Adams Ave., Phila., Pa., department store, approx. **$250,000.**

N. M., Aubuquerque—Texas Consolidated Theatres, Inc., Majestic Bldg., Dallas, Tex., plans by Jack Corgan, 2008 Jackson St., steel deck theatre. **$250,000.**

N. Y., Brooklyn—Parkway Gardens, Inc., 285 Grand St., Zone 11, plans by Oscar I. Silverstone, 153 Pierrepont St., Zone 2, 65 two-family houses, 247-306 Bay 19 St. and 1333 to 1337 Shore Parkway. **$930,000.**

N. Y., New York—Church of St. Anthony of Padua, 151 Sullivan St., Zone 12, plans by Vincent S. Todaro, 1901 W. 12 St., Brooklyn, Zone 23, church and monastery alterations. **$250,000.**

N. Y., New York—Fawcett Publications, Inc., 67-77 W. 44 St., Zone 18, office alterations. **$350,000.** Schuman & Lichtenstein, 369 Lexington Ave., Zone 17, engrs.

N. Y., New York—St. Johns Roman Catholic Church, 3021 Kingsbridge Ave., Zone 63, plans by William J. Beogel, 516 Fifth Ave., Zone 18, 4 story convent, 230 St. and Corlear Ave. **$250,000.**

N. C., Thomasville — Memorial Methodist Church, c/o Rev. Wilson O. Weldon, pastor, Thomasville, plans by Marvin W. Helms, 1001 E. Blvd., Charlotte, church. **$400,000.**

N. D., Williston—Bethel Lutheran Home, Williston, home for aged. **$250,000.**

O., Columbus — St. Ann's Maternity Hospital, 1555 Bryden Rd., plans by Louis F. Karlsberger, 630 E. Broad St., hospital addn., alterations.

O., Columbus — St. Anthony's Hospital, 1450 Hawthorne St., plans by Louis F. Karlsberger, 630 E. Broad St., hospital addn., alterations.

Pa., Drexel Hill—Broad St. Methodist Episcopal Church, 3212 School Lane, plans by A. Hensel Fink, 1707 Arch St., Phila., church and Sunday school. **$285,000.** CD 4/29/48—ENR 5/13/48.

Pa., Harrisburg—G. C. Murphy Co., 215 Market St., plans by W. R. Harkness, c/o owner, Five and Ten Cent Store alterations, addns., 215 Market St. **$500,000.**

Pa., Norristown—Montgomery Chiropractic Hospital and Sanitorium, 1211 Chestnut St., Phila., hospital. **$250,000.**

Pa., Phila.—Owner c/o Peter F. Getz, 1634 N. 6 St., church and rectory. Approx. **$250,000.** CD 2/3/48—ENR 2/19/48.

Pa., Pittsburgh — Bell Telephone Co. of Pennsylvania, 416 7th Ave., plans by Press C. Dowler, 130 7 St., brick, tile telephone office addns., alterations, 223 N. Highland Ave. Approx. **$250,000.**

Pa., Pittsburgh—St. Wendelin's R. C. Congregation, Custer Ave., plans by Marlier, Wolfe & Johnstone, 1016 Empire Bldg., 2 story, bsmnt. brick, tile parochial high school. **$250,000.**

Pa., Springfield—Holy Cross Roman Catholic Church, Rev. Louis J. Meyer, rector, 201 Bishop Ave., church, school, rectory and convent. Approx. **$250,000.**

R. I., Providence—United Public Markets, Inc., 60 Dexter St., Pawtucket, plans by Samuel Lerner, 1214 Union Trust Bldg., 1 story, bsmnt., brick, cinder block business bldg., incl. super market, storage, etc. **$275,000.**

Tenn., Memphis — LeMoyne College, c/o George W. Awsumb, archt., Falls Bldg., gymnasium-auditorium. **$280,000.**

Tex., Alice—Alice Country Club, C. M. Hughett, pres., Alice, club house, rein.-con. swimming pool, site development, grading, levelling. **$275,000.**

Tex., Austin—Country Club of Austin Building Corp., F. Reeves, pres., c/o Page, Southerland & Page, archts., 602 West Ave., country club on 200 acre site, incl. 18 hole golf course, locker rooms, athletic courts, outdoor rein.-con. swimming pool. **$300,000.**

Tex., Beaumont — Young Mens Christian Assn., 934 Calder St., masonry Y. M. C. A. bldg. **$250,000.**

Tex., Brownsville—Mercy Hospital, Brownsville, plans by Page, Southerland & Page, 602

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West Ave., Austin, 3 story, part bsmnt hospital addn. **$300,000.** Wilson & Cottingham, Littlefield Bldg., Austin, structural engrs. Landauer & Guerrero, 4801 Lemmon St., Dallas, mechanical engrs.

●**Tex., Corpus Christi**—Sam E. Wilson, Jr., Driscoll Bldg., plans by Walter W. Ahlschlager, 212 S. St. Paul St., Dallas, 15 story, bsmnt., masonry, brick, stone office, 4 high speed electric passenger elevators, air-conditioning, Leopard and Carancahua Sts. **$2,400,000.**

Tex., Dallas—Immaculate Heart of Mary Mission Society, Catholic School for Boys (Episcopal Diocese), c/o Rev. C. Avery Mason, 5100 Ross St., plans by Emil Fretz, 711 Liberty St., school, **$500,000;** Lower and Upper School with auditorium, **$225,000.** CD 6/19/47—ENR 7/10/47.

Tex., Dallas—Tom Lively & Assoc., 6334½ Gaston St., plans by George W. Edwards, 1509-A Cochran St., 10 one story Negro rental apartments, on 4 acre tract west of Harry Hines Blvd. **$250,000.**

Tex., Dallas—John A. Masen, 4586 Rheimes St., 100 low cost housing units. **$300,000.**

Tex., Dallas—Harley Sadler, Sweetwater, theatre, Lake June Rd. **$300,000.**

●**Tex., Dallas**—Homer W. Snowden, 6336 Richmond St., shopping village. **$1,000,000.**

Tex., Fort Worth — Riverside Baptist Church, c/o Rev. Judson Prince, pastor, 3119 Race St., plans by Easterwood & Easterwood, 309 Bewley Bldg., 1 and 2 story, 100x154 ft., brick, stone, steel church. **$250,000.**

Tex., Garland—Airlawn Constr. Co., 4624 March St., Dallas, plans by Avery & Shanklin & Assoc., 2022 Bryan St., Dallas, 40 residences, **$250,000.**

Tex., Houston — Baylor University College of Medicine, Medical Center, student union. **$350,000.**

Tex., Houston—Christ Church Cathedral, Dannin and Texas Sts., social hall, educational remodeling. **$350,000.**

Tex., Houston—Tom C. Rhodes & Assoc., Brookside Dr. between Lawndale and Harrisburg Sts., 4 brick apartments, concrete slab fdn. **$300,000.**

Tex., Houston — Rice Institute, M. Esperson Bldg., student union. **$400,000.**

●**Tex., Houston**—Sears, Roebuck & Co., 4207 Main St., plans by George L. Dahl, 1920½ Main St., Dallas, 150,000 sq. ft. masonry, steel mercantile store, North Shepherd Dr. **$1,250,000.** Cowell & Newhaus, 4511 Kyle St. consult. engrs. CD 2/10—ENR 3/3.

Tex., Houston—Southmayd Building Co., 2300 Pease St., 69 frame, sheetrock, etc. dwellings, concrete slab fdns., Halsey and Iowa Jima Rds. portion of South Park subdivision. **$150,000.**

Tex., Kilgore—Kilgore Home Builders, Kilgore, housing. **$250,000.**

●**Tex., McAllen**—M. C. Rutherford Co., Hoyt E. Morris, McAllen, 200 low cost housing units. **$1,000,000.**

●**Tex., Pasadena**—Charles R. Olds & Assoc., 3425 University St., Houston, 1,500 duplexes and dwellings, **$8,000,000;** shopping center, **$450,000,** East Pasadena Development Proj.

Tex., San Antonio—C. M. Barley, 505 Winnepeg St., frame type housing, off Austin Hy. **$250,000.**

Tex., San Antonio—Belmeade Corp., c/o Albert Steves, III, 716 E. Commerce St., plans by Glenn C. Wilson, 1510 Majestic Bldg., masonry community center, Burr Rd. and Military Hy. **$250,000.**

Tex., San Antonio—Roland C. Bremer & J. P. Wilhelm, 2410 W. Summit St., 92 dwellings, in Eastlawn addn. north of E. Houston St. **$550,000.**

Tex., San Antonio—E. J. Burke & Sons, 4220 S. Zarzamora St., plans by W. D. Van Der Heck & Assoc., 4220 S. Zarzamora St., 2 story masonry apartments off North New Braunfels Ave. **$450,000;** 80 units in single family houses and duplexes off New Braunfels Ave., **$500,000.**

Tex., San Antonio—H. E. Butt Grocery Co., Robstown Rd., Corpus Christi, brick, steel, concrete, hollow tile supermarkets, Harlandale Sect. **$300,000;** in the Highlands, and off N. New Braunfels Ave., **$250,000** each.

Tex., San Antonio — Catholic Church, c/o Archbishop Robert E. Lucey, Dwyer Ave., church and school in Shearer Hills. Approx. **$350,000.**

Tex., San Antonio—L. Fred Hoey, Grove and Broadway Sts., Alamo Heights, plans by DeHaven Pitts, 209 San Pedro Ave., community center. **$250,000.**

●**Tex., San Antonio**—Billy Mitchell Village, Inc., c/o Arthur E. Baird, San Pedro Ave., 408-unit brick veneer garden apartment center, concrete slab fdn., Lackland and Frio City Rds. at entrance to Kelly Field and Lackland Air Base, **$4,000,000;** community center, near entrance to Kelly Field and adjacent to Lackland Air Base, **$250,000.** Erwin Gerber, 44 Commerce St., Newark, N. J., and Frank T. Drought, 117 W. Pecan St., project engrs.

Tex., San Antonio—Frank Robertson, Majestic Bldg., 150 residences, East Shearer Hills. **$750,000.**

Tex., San Antonio—J. K. Stark, 302 College Ave., housing off Austin Hy. **$300,000.**

Tex., Tyler — B. P. O. E. Lodge 215, c/o M. D. Cadman, Citizens Bank Bldg., plans by Gregory & Cates, 207 W. Erwin St., 3 story, 50x117 ft., brick, hollow tile granite, stone

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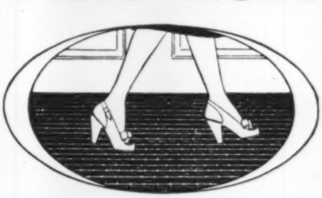

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Wash., Longview — Longview Park, Inc., Longview, 87 houses. **$435,000.**

Wash., Seattle—D. M. Narodick & R. P. Hebb, 2310 Eastmont Way, plans by Stuart & Durham, 110 Denny Way, 6 story, rein.-con., masonry Queen Vista Apartment. **$700,000.**

Wash., Seattle—Seattle Pacific College, 3307 3 Ave. W., plans by W. G. Brust, Republic Bldg., Zone 1, gymnasium. **$250,000.**

Wash., Seattle—First Methodist Church, 5 Ave. and Marion St., Zone 4, plans by Hensel Fink, 1701 Arch St., Phila., Pa., 2 and 4 story educational bldg. **$300,000.** CD 3/2/48—ENR 3/11/48.

●**Wash., Yakima**—Yakima Community Hotel Corp., c/o Chamber of Commerce, Yakima, completion skeleton hotel. **$1,000,000.**

Alaska, Anchorage—Turnagain, Inc., Anchorage, plans by Manley & Mayer, Anchorage, 7 story rein.-con., steel apartment. **$700,000.**

●**Alta., Edmonton**—Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, Que., plans by Geo. F. Drummond, c/o owner, MacDonald Hotel addn. **$4,000,000.** Holabird & Root & Burgee, 180 N. Wabash St., Chicago, Ill., U. S. A., engr. CD 11/9/44—ENR 12/14/44.

N. S., Truro—Syndicate, c/o Ministry of Industry & Publicity, Halifax, hotel. **$600,000.**

Ont., Ottawa—Dr. C. Shapiro, 221 O'Connor St., 94 dwellings, Base Line Rd. **$890,000.**

Ont., St. Catherines — Richard Reynolds Schmon Memorial Hospital, St. Catherines, hospital and hall. **$450,000.**

Que., Three Rivers—Frank Spenard, 936 Notre Dame St., bldg., on site of old market. Approx. **$500,000.**

Que., Victoriaville—Roman Catholic Diocese of Nicolet, c/o Rev. A. Pellerin, Victoriaville, church for parish of The Canadian Martyrs. **$250,000.**

INDUSTRIAL BUILDINGS

Calif., Arcadia—WAREHOUSE, etc.—Bekins Van & Storage Co., 1335 S. Figueroa St., Los Angeles, 4 story, 70x111 ft., rein.-con. storage warehouse and store, Huntington Dr. **$200,000.** C. Deuel and G. E. Smith, 3806 Beverly Blvd., Los Angeles, consult. engrs.

Calif., Los Angeles—ARCHIVES—Security First National Bank, 561 S. Spring St., plans by Parkinson, Powelson, Briney, Bernard, Woodford, 410 N. La Brea St., 2 story, 45x120 ft., rein.-con. archive bldg. Approx. **$100,000.**

Colo., Denver—PLANT—Denver Cinder Tile, Inc., 1155 W. 5 Ave., cinder block mfg. plant between South Clay and South Federal Bldg., north of Englewood Speedway, **$400,000.**

●**Ga., Albany** — TANNERY — Dixie Leather Corp., c/o Graton & Knight Co., 356 Franklin St., Worcester, Mass., tannery with capacity of 6,000 hides weekly. **$1,000,000.**

Ill., East Joliet (Joliet P. O.)—GARAGE, etc.—Elgin, Joliet & Eastern R. R., F. G. Campbell, ch. engr., Joliet, 54 x 132 ft., concrete garage, yard office and locker bldg., north end of yard, yard office and sanitary facilities, south end of yard, **$100,500.**

●**Ill., Hennepin** — POWER PLANT — Illinois Power Co., 284 E. Simmons Sta., Galesburg, power plant. **$10,000,000.**

●**Ill., Lincolnwood**—FACTORY—Ditto, Inc., 2243 W. Harrison St., plans by Battey & Childs, 231 S. LaSalle St., Chicago, 1 story, brick, steel factory, 3 story concrete, steel office, **$1,600,000.** CD 6/27/46—ENR 7/11/46.

Ind., Hammond—PLANT—Rand-McNally & Co., 601 Conkey St., plant addns. **$800,000.**

Kan., Dodge City—GRAIN ELEVATOR—Colorado Milling & Elevator Co., Equitable Bldg., Denver, Colo., grain elevator, **$500,000.**

Mo., St. Louis—WAREHOUSE etc.—Republic Bag Co., M. A. Greenberg, pres., 1538 Blair Ave., Zone 6, 1 story, brick, concrete, steel warehouse, office, Papin St. west of Ohio Ave. Approx. **$200,000.**

Mo., St. Louis Co.—FACTORY—St. Louis Broom Co., 2305 Dickson St., St. Louis, Zone 6, 98 x 300 ft. factory, St. Charles Rd., (U. S. 40,) and Engelholm Ave.

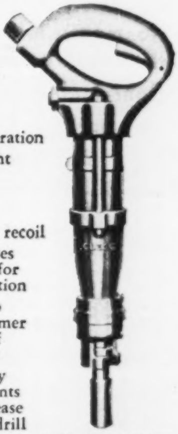
N. J., Vineland—SUPER MARKET—Baltimore Markets, Inc., 2301 Walnut St., Phila., Pa., super market, **$250,000.**

N. C., Raleigh—WAREHOUSE, etc.—Colonial Stores, Inc., 682 Whitehall St., S. W., Atlanta, Ga., 150,000 sq. ft., structural steel, brick distributing warehouse, garage, etc., concrete fdns., on 84 acre site on northern outskirts of city on U. S. Rt. 1.

O., Mansfield — PLANT—Mansfield New Journal, S. A. Horvit, pres., 24 W. 4 St., plans by Charles W. Conklin, Farmers Bank Bldg., 3 story 85 x 152 ft., steel or rein.-con. and brick newspaper plant, W. 4 and Mulbery Sts. between Weldon and W. Temple Sts. **$500,000.** Vincent Eaton, Caxton Bldg., Cleveland, heating engr. Paul C. Mehnert, 2232 Cummington Rd., Cleveland, electrical engr.

Okla., Oklahoma City — WAREHOUSE—Safeway Stores Co., 4 and Jackson Sts., Oakland, Calif., concrete, steel grocery warehouse, N. E. 29 and Santa Fe Sts. **$100,000.**

Okla., Oklahoma City—WAREHOUSE—Warren Transfer & Storage Co., 2 N. W. 11 St.,



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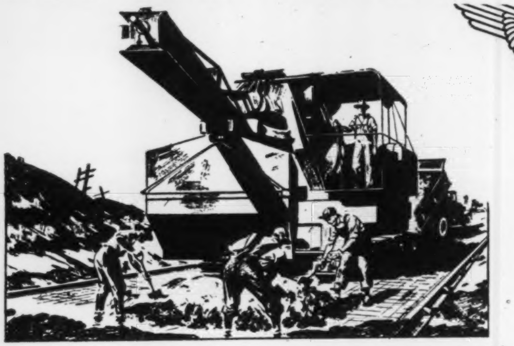

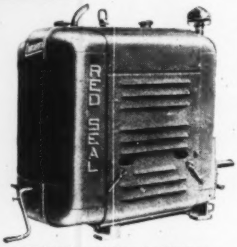

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plans by Berlowitz & Commander, 1916 N. Broadway, warehouse, N. E. 30 and Santa Fe Sts. **$175,000.**

Pa., Phila.—PACKING PLANT, etc.—Armour & Co., 917 Noble St., Phila., packing plant, warehouse and office. Approx. **$250,000.**

Pa., Reading—GARAGE—Frederick Morganstern, 436 Central St., plans by Muhlenberg, Yerkes & Muhlenberg, Ganster Bldg., concrete block, steel garage. **$150,000.**

Pa., Upper Darby—GARAGE—Phila. Suburban Transportation Co., 69 St. Terminal Bldg., garage and office. **$300,000.**

●Pa., West Mifflin—POWER PLANT—Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, plans by Hunting, Larsen & Dunnells, 1150 Century Bldg., Pittsburgh, 2 story, 50x400 ft. brick, tile atomic power plant, 2 story 50x300 ft., brick, tile administration bldg., Lebanon Church Rd. **$1,000,000.**

S. C., Winnsboro—LABORATORY—U. S. Rubber Co., 1230 6 Ave., New York, N. Y., laboratory. **$250,000.**

Tex., Corsicana — STORAGE, etc. — Navarro County Electric Co-operative, Inc., Coriscana, plans by J. E. Metcalf & Son, Corsicana, brick, concrete, steel REA storage and administration bldg. **$100,000.**

Tex., Dallas—PLANT—Homelite Corp., 3400 Ross Ave., 20,000 sq. ft. plant, 167 Leslie St. **$100,000.**

Tex., Houston—DAIRY PRODUCTS—Leonard C. Miller, 2503 Evergreen St., 25 unit dairy products. **$550,000.**

Tex., Kilgore — AUTO SERVICE — Center Chevrolet Co., Kilgore, auto service, shop, display, parts storage. **$175,000.**

Tex., Midland — PLANT — Pittsburgh Plate Glass Co., c/o T. Jackson, 2nd unit of Santa Fe Bldg., Dallas, plans by Walter W. Ahlschlager, 212 S. St. Paul St., 140x143 ft. glass block, concrete plant and shop, air-conditioning, acoustical treatment, etc. **$150,000.**

Tex., Port Arthur—PLANT—Jones-Laughlin Steel Co., Port Arthur, modernizing, expanding steel barrel plant. **$125,003.**

●Wash., Anacortes—STEAM PLANT—Skagit County Public Utility Dist., Mount Vernon, steam plant. **$3,000,000.** Harza Eng. Co., 400 W. Madison St., Chicago, Ill., consult. engr.

Wash., Spokane — LAUNDRY — American Laundry, W 1111 2 St., plans by Funk, Molander & Johnson, S 7 Wall St., rebuilding laundry. **$150,000.**

Wis., Green Bay — WAREHOUSE — Atlas Warehouse & Storage Co., Morrow St., plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., 1 story, bsmnt., 112x142 ft. brick, block warehouse addn., block fdn.

Wis., Wausau — STORAGE GARAGE — Albrent Freight & Storage Co., 105 Prospect Ave., plans by I. A. Abel, Wausau, 1 story, 100x150 ft., brick, block storage garage addn., stone fdn.

Alta., Edmonton—PLANT—Coca Cola Co. of Canada, Ltd., 90 Broadview, Toronto, Ont., plant. **$400,000.**

●Alta., Red Deer—MILL—Alberta Pulp Mills Ltd., Red Deer, pulp mill. **$10,000,000.** Cellulose Engineers Ltd., 71 Columbia St., Seattle, Wash., U. S. A., engr. CD 12/30—ENR 1/20.

Ont., Barrie — FACTORY — Lufkin Rule Corp., Saginaw, Mich., U. S. A., plans by G. S. Adamson, 906 Yonge St., Toronto, factory, **$100,000.**

Ont., London—PLANT Eaton Wilson Rich Co., Windsor, plant, Highbury Ave. **$100,000.**

Ont., Mimico—FACTORY—Stone Straw Corp. of Canada, 575 Adelaide St. W., Toronto, plans by A. J. Heeney, 73 Bonstead Ave., Toronto, 1 story, bsmnt., 140x160 ft. steel, concrete, brick factory, Lake Shore Rd., near Mimico Creek. Approx. **$150,000.**

Ont., Toronto—STEAM POWER UNIT—Consumer Gas Co. Ltd., 19 Toronto St., steam power unit on 76 acre site, Eastern Gap area.

Que., Beauport—FACTORY—Joseph Grenier Co. Ltd., Beauport, factory, **$150,000.**

Que., Dorval—PLANT—F. P. Lalonde Ltd., 366 Inspector St., plans by A. L. Perry, 1502 St. Catherine St. W. Montreal, 1 story, 83x132 ft. concrete, steel, brick plant.

Que., Rouyn—MILL—New Rouyn Merger Mines Ltd., 603 Royal Bank Bldg., Toronto, plant. **$136,000.**

Sask., Goldfields—MINE DEVELOPMENT—Eldorado Mining & Refining Co. Ltd., c/o W. J. Bennett, Ottawa, Ont., uranium mine development.

UNCLASSIFIED

Alabama—RURAL DISTRIBUTION LINES—Baldwin Co. Electric Membership Corp., Robertsdale, 90 mi. rural distr. line, sys. imprvs., headquarters facilities and 2 way radio communication sys. Baldwin Co. **$280,000.**

Alabama—RURAL DISTRIBUTION LINES—North Alabama Electric Co-operative, Stevenson, 230 mi. rural distr. lines and sys. imprvs., Jackson Co. **$620,000.**

Arkansas—RURAL DISTRIBUTION LINES—Carroll Electric Corp., Berryville, 404 mi. rural distr. line and sys. imprvs., Proj. Ark. 18-P-S-T-U, Carroll Co., etc. **$900,000.** Frank Horton & Co., Lamar, Mo., consult. engr. CD 3/30.

Ark., DeQueen—GAS DISTRIBUTION SYSTEM—City, natural gas distr. sys., incl. 30 mi. transmission line, **$500,000.** Marion L. Crist & Assoc., Union Life Bldg., Little Rock, consult. engrs.

Ark., Little Rock—PLAYGROUNDS, etc.—City Parks & Recreation Dpt., City Hall, 4 playgrounds, swimming pool for negroes, **$360,000.**

Calif., Quincy—EXHIBIT BLDGS.—Plumas Co. Fair Assn., Fairgrounds, Quincy, plans by Ralph N. Pollack & C. St. George-Pope, 605 Market St., San Francisco, 2 exhibit bldgs. **$100,000.** Clyde C. Kennedy, 604 Mission St., San Francisco, consult. engr.

Calif., Riverside — DISTRIBUTION STATIONS—Riverside City Utilities Bd., L. N. Grayson, supt., Riverside, 3 electric distr. stations. **$450,000.**

Colo., Colorado Springs—PARK, etc.—City, voted bonds, park and recreational development; defeated bonds chair lift type ski tow and other developments in winter sports, on slopes of Pikes Peak, **$350,000.**

Colo., Denver — RACE TRACK — The Mile High Kennel Club, Denver, plans by Patrick D. Morgan, 1005 Jackson St., dog race track, incl. grandstand, kennel bldg., parking area, club house and fencing. Ross & Welsh, 817 Detroit St., engrs.

●**Colo., Littleton**—RACE TRACK, etc.—Centennial Turf Club, c/o Roy D. Barnes, pres., E. & C. Bldg., Denver, plans by Henry A. Koch, Chamber of Commerce Bldg., Denver, and Clarence W. Mayhew, 251 Post St., San Francisco, Calif., race track, concrete, steel grandstand, club house, incl. cafe, cocktail lounge, dining rooms, kitchens, etc., 1,500 horse stable and jockeys quarters, fire stations, to be known as Colorful Downs, near here. **$1,750,000.**

Georgia—RURAL DISTRIBUTION LINES—Blue Ridge Electric Assn., Young Harris, 150 mi. rural distr. line, sys. imprvs., and completed constr. with prior REA approval, Towns Co. **$355,000.**

Georgia—RURAL DISTRIBUTION LINES—Habersham Electric Membership Corp., Clarkesville, 184 mi. rural distr. lines, sys. imprvs., 25 mi. tie lines, Habersham Co. **$330,000.**

Georgia—RURAL DISTRIBUTION LINES—Hart County Electric Membership Co-operative, Hartwell, 100 mi. rural distr. lines, Hart Co., **$340,000.** Marcus C. Long, Alma, consult. engr. CD 3/18—ENR 3/31.

Georgia—RURAL DISTRIBUTION LINES—Jackson Electric Membership Corp., Jefferson, 116 mi. rural distr. line, sys. imprvs., 23 mi. new tie lines, headquarters facilities, two-way radio communication sys., completion previously approved constr., Jackson Co. **$305,000.**

●**Illinois-Indiana-Ohio**—PIPELINE—Ohio Oil Co., Findlay, O., replacement, rehabilitation pipeline between Wood River, Ill. and Lima, O. **$10,000,000.**

Ind., Madison—DRIVE-IN-THEATRE—Sky Line Drive-In-Theatre Co., New Albany, drive-in theatre, State Rt. 107, **$100,000.**

Ind., West Lafayette—BLEACHERS—Purdue University Bd. Trustees, R. B. Stewart, controller, West Lafayette, 60x419 ft. steel bleachers, **$200,000.** M. L. Leeper, 268 Chase St., Gary, consult. engr.

Iowa — RURAL DISTRIBUTION LINES — Buchanan Co. Rural Electric Co-operative, Independence, rural distr. lines, Buchanan Co. **$240,000.** A. W. Grubb, Vinton, engr. CD 4/26/46—ENR 5/16/46.

Iowa — RURAL DISTRIBUTION LINES — Chariton Valley Electric Co-operative, Albia, rural distr. lines, Monroe Co. **$320,000.** Brown Eng. Co., K. P. Bldg., Des Moines, engr.

Iowa — RURAL DISTRIBUTION LINES — Nishnabotna Valley Rural Electric Co-operative, Harlan, rural distr. lines, Shelby Co. **$640,000.** H. D. LaFollete, Harlan, engr. CD 6/25/46.

Iowa — RURAL DISTRIBUTION LINES—Osceola Rural Electric Co-operative, Sibley, rural distr. lines, Osceola Co. **$151,000.** P. L. Burns, Davenport Bank Bldg., Davenport, engr.

Kansas—RURAL DISTRIBUTION LINES—Town Valley Electric Co-operative, Altamont, 156 mi. rural distr. lines, sys. imprvs., Labette Co. **$345,000.**

Kansas—RURAL DISTRIBUTION LINES—Victory Electric Co-operative Assn., Dodge City, 358 mi. rural distr. lines, sys. imprvs., 15 mi. new tie lines, two-way radio communication sys., Ford Co. **$496,000.**

Kan., Kansas City—DRIVE-IN-THEATRE—Shawnee Co., State Hy. 10 and Road 29, RFD from Kansas City, drive-in theater, **$175,000.**

Kan., Leavenworth—DRIVE-IN THEATRE—Durwood Theatres, Stanley Durwood, pres., Waldheim Bldg., Kansas City, Mo., drive-in theatre. **$150,000.** Truman Schlup, 1401 Fairfax Trafficway, Kansas City, Kan., engr.

Ky., Madisonville—DRIVE-IN THEATRE—Crescent Amusement Co., R. E. Baulch, pres., 147 Fifth Ave. N., Nashville, Tenn., drive-in theatre, U. S. 41 south of here, 12 acre site, Approx. **$100,000.**

†**Mass., North Attleboro**—FISH HATCHERY—Fish & Wild Life Service, Dpt. Interior, C. St. between 18 and 19 Sts. N. W. Wash., 25, D. C., fish hatchery. **$300,000.**

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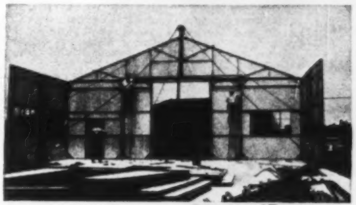

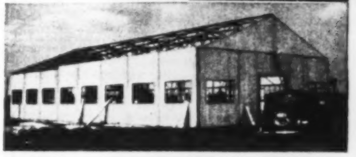

Above: Sidewalls fabricated in panels for easy erection

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Missouri—RAILROAD—Chicago, Burlington & Quincy R. R. Co., H. R Clarke, ch. engr., 547 W. Jackson Blvd., Chicago 6, Ill., 7 mi. railroad between Forkner and to Brookfield, on new line between Brookfield and Kansas City.

Missouri — RAILROAD — Kansas City & Brookfield R. R. Brookfield and c/o Chicago, Burlington & Quincy R. R. Co., H. R. Clarke, ch. engr., 547 W. Jackson Bldg., Chicago 6, Ill., 45.3 mi. standard gage railroad line, bridges, culverts, sidings, signal sys. etc., between Missouri City Junction and Tina Junction.

●**Missouri**—RURAL DISTRIBUTION LINES—Sho-Me Power Corp., Marshfield, 167.5 mi. rural distr. lines, 13 substations, equip., auxliaries, central and southern Missouri. **$2,600,000.**

Mont., Great Falls — FAIR GROUND IMPRV.—North Montana State Fair Bd., Montana Bank Bldg., plans by W. S. Killgreen, 2019 4 Ave., fair ground imprvs., incl. race horse bar, livestock sales and judging ring, driveways and walks, bldg. alterations, imprvs., 4-H club facilities, light imprvs. **$150,000.** CD 2/9/45—ENR 3/8/45.

North Dakota—RURAL DISTRIBUTION LINES—KEM Electric Co-operative, Inc., Linton, 592 mi. rural distr. lines, Emmons Co. **$592,000.** Ulteig Eng. Corp., 1114½ Front St., Fargo, consult. engrs.

Nebraska—RURAL DISTRIBUTION LINES—Niobrara Membership Corp., O'Neil, 235 mi. rural distr. lines, Boyd and Holt Counties. **$235,000.** Henningson Eng. Co., Standard Oil Bldg., Omaha, consult. engr.

Nebraska—RURAL DISTRIBUTION LINES—Niobrara Electric Membership Assn., Hay Springs, rural distr. lines, Dawes and Sheridan Counties. **$558,000.** Walter Walking, 2640 Kearney St., Denver, Colo., consult. engr. CD 11/5—ENR 11/18.

Nebraska—RURAL DISTRIBUTION LINES—Panhandle Rural Electric Membership Assn., Alliance, 470 mi. rural distr. lines, Box Butte Co., **$450,000.** Raymond H. Reed & Co., Columbus, consult. engrs. CD 9/18/47—ENR 10/2/47.

●**Nebraska**—RURAL DISTRIBUTION LINES—Twin Valley Electric Membership Assn., Cambridge, rural distr. lines and sys. imprvs., Furnas Co. **$1,769,000.** Flora Eng. Co., 1717 E. Colfax Ave., Denver, Colo., consult. engr. CD 12/27—ENR 1/20.

North Carolina — RURAL DISTRIBUTION LINES—Piedmont Electric Membership Corp., Hillsboro, 112 mi. rural distr. lines and sys. imprvs., Person Co. **$167,000.**

North Dakota—RURAL DISTRIBUTION LINES—McKenzie Electric Co-operative, Inc., Watford City, 362 mi. rural distr. lines, McKenzie Co. **$362,000.** Banister Eng. Co., 1549 University Ave., St. Paul 4, Minn., consult. engr. CD 10/28—ENR 11/11.

Ohio — RURAL DISTRIBUTION LINES — Pioneer Rural Electric Co-operative, Piqua, 40 mi. rural distr. lines, 38 mi. transmission line and sys. imprvs., Miami Co. **$600,000.**

●†**Oklahoma** — TRANSMISSION LINES — Southwestern Power Admin., P. O. Drawer 1619, Tulsa, Zone 1.

Caddo Co.—78 mi. 66 kv. electric transmission line from Lindsay to Anadarko, **$730,000.**

Carter Co.—46 mi. 66 kv. electric transmission line from Ardmore to Marietta, **$188,000.**

Garvin Co.—138 mi. 132 kv. electric transmission line from Lulu to Lindsay, **$1,124,200.**

Johnston Co.—70 mi. 66 kv. electric transmission line from Russett to Tishomingo, **$206,800.**

47 mi. 66 kv. electric transmission line from Tishomingo to Conneville, **$155,100.**

Marshall Co.—52 mi. 66 kv. electric transmission line from Russett to Madill, **$94,000.**

Murray Co.—72 mi. 66 kv. electric transmission line from Connerville to Sulphur, **$207,000.**

Okemah Co.—42 mi. 66 kv. electric transmission line from Okemah to Prague, **$206,800.**

Okfuskee Co.—27 mi. 66 kv. electric transmission line from Okemah to Weleetka, **$155,100.**

Seminole Co.—38 mi. 66 kv. electric transmission line from Seminole to Tecumseh, **$156,000.**

Sequoyah Co.—54 mi. 66 kv. electric transmission line from Gore to Webber Falls, **$196,000.**

Stephens Co.—118 mi. 66 kv. electric transmission line from Comanche to Lindsay, **$517,000.**

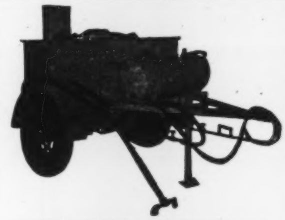
Okla., Elk City — GATHERING LINES — Shell Oil Co., Shell Bldg., Houston, Tex., 15 mi. 4- to 8-in. oil field gathering lines. **$150,000.**

Okla., Oklahoma City — COLISEUM — State Fair Bd., Oklahoma City, coliseum, N. W. Reno and May Aves. **$750,000.**

Oregon—RURAL DISTRIBUTION LINES—Blachly-Lane Co. Co-operative Electric Assoc., Blachly, 19 mi. 33 kv. rural distr. lines and sys. imprvs., Lane Co. **$250,000.**

Pennsylvania — RURAL DISTRIBUTION LINES—Bedford Rural Electric Co-operative, Inc., Bedford, 195 mi. rural distr. lines, Bedford Co. **$195,000.** Johnson & Williams, 1225 19 St. N. W. Wash. 6, D. C., consult. engrs. CD 11/26—ENR 12/30.

R. I., Narragansett—RECREATION PROJECT—Rhode Island Baptist Assn., Rev. Paul R. Shaub, 23 Howard St., Cranston, plans by Carpenter & Maddox, Baywood St., Greenwood,



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recreation proj. summer camp, incl. altering bldg. for chapel, construct dining hall and kitchen, log and stone cabins, play and sports facilities. **$115,000.** CD 7/30—ENR 8/26.

South Dakota — RURAL DISTRIBUTION LINES—Butte Electric Assn., Newell, 25 mi. rural distr. lines, sys. imprvs., completing previously approved constr., Butte Co. **$130,000.** Ulteig Eng. Corp., 1114½ Front St., Fargo, N. D., consult. engrs. CD 3/29.

South Dakota — RURAL DISTRIBUTION LINES—LaCreek Electric Assoc. Inc., Box 302, Martin, 260 mi. rural distr. lines, Bennett Co. **$260,000.** Scott Eng. Co., 10 Second St. S. E., Watertown, consult. engr. CD 1/22/48—ENR 2/5/48.

South Dakota — RURAL DISTRIBUTION LINES—Tri-County Electric Assn., Plankinton, 605 mi. rural distr. lines and completing previously approved constr., Aurora Co. **$910,000.**

Texas—RURAL DISTRIBUTION LINES—Houston County Electric Co-operative, Crockett, addnl. rural distr. lines, sys. imprvs., Houston Co. **$450,000.**

Texas—RURAL DISTRIBUTION LINES—Medina Electric Co-operative, Hondo, addnl. rural distr. lines, sys. imprvs. Medina Co. **$825,000.**

†Texas—ELECTRIC DISTRIBUTION LINES—Southwestern Power Admin., Denison, electric distr. lines, radiating from Denison-Red River Dam and hydro power, Denison area. **$800,000.**

Tex., College — STADIUM — Agricultural & Mechanical College of Texas, College Station, stadium enlargement. Approx. **$100,000.** W. E. Simpson Co., Milam Bldg., San Antonio, consult. engr. CD 2/18/46—ENR 3/7/46.

●Tex., Waco—STADIUM—Baylor University, Waco, 40,000 seating capacity, rein.-con., steel stadium. **$1,600,000.** W. E. Simpson, Milam Bldg., San Antonio, engr. CD 12/1—ENR 12/30.

Virginia—RURAL DISTRIBUTION LINES—Northern Neck Electric Co-operative, Warsaw, 75 mi. rural distr. lines, sys. imprvs., Lancaster Co. **$420,000.** CD 5/19/48—ENR 6/10/48.

Virginia—RURAL DISTRIBUTION LINES—Shenandoah Valley Electric Co-operative, expansion rural distr. line facilities, Rockingham Shenandoah, Rockbridge and near by counties, **$300,000.**

●Washington — DAM TRANSMISSION LINES, etc.—Skagit County Public Utility Dist., Mount Vernon, hydro-electric dam and plant on Illabot Creek near Concrete, **$5,000,000;** transmission lines and substations, **$1,250,000.** Skagit Co. Harza Eng. Co., 400 W. Madison St., Chicago, Ill., consult. engr. CD 9/27/48—ENR 10/28/48.

Wisconsin—RURAL DISTRIBUTION LINES—Chippewa Valley Electric Co-operative, Cornell, sys. imprvs., 6 mi. tie lines and headquarters and warehouse facilities, Chippewa Co. **$148,000.**

Wisconsin—RURAL DISTRIBUTION LINES Oakdale Co-operative Electric Assoc., Oakdale, 27 mi. rural distr. lines, sys. imprvs., Monroe Co. **$330,000.**

Wyoming—RURAL DISTRIBUTION LINES Wheatland Rural Electric Assn., Wheatland, rehabilitation 2 mi. line, sys. imprvs., 1 mi. tie line, 23 mi. rural distr. lines and headquarters facilities, Platte Co. **$131,000.** Walter Walking, 2640 Kearney St., Denver, Colo., consult. engr. CD 7/19/46—ENR 8/8/46.

Alberta—GAS PIPELINE—Westcoast Transmission Co. Ltd., c/o Farris, Stultz, Bull & Farris, Edmonton, natural gas pipeline from Edmonton, Alta., to point in northeastern British Columbia, and to Washington, U. S. A.

●Alta, St. Paul—OIL WELLS—Hudson's Bay Oil & Gas Co. Ltd., Edmonton, 14 oil wells, near here, in Vermillion Lloydminster area, **$4,000,000.**

Manitoba—RAILROAD—Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, ch. engr., railroad from Arborfield to The Pas; railroad from Paddock Wood to Lac la Ronge.

Newfoundland, St. Johns—ARENA, etc.—Kinsmen, Lions & Rotary Clubs, c/o G. R. Jack, city engr., arena, ice skating rink. Approx. **$400,000.** G. R. Jack, city engr.

●Newfoundland, St. Johns — TOWNSITE — Buchans Mining Co., St. Johns, townsite, incl. 100 houses, schools, stores, municipal and company office bldgs., 350 mi. from here. Approx. **$2,000,000.**

Ontario — RAILROAD IMPRVS. — Ontario Northland Railway, H. W. Sharpe, mech. engr., North Bay, double tracking railroad between Cochrane and Moosonee, **$500,000.**

●Ont., Ottawa — DAM, etc. — Hydro Electric Power Comn. of Ontario, University Ave., Toronto, dam and generating plant, Chandiere Falls, Ottawa River. Approx. **$10,000,000.**

Que., Cap dela Madeleine—ICE ARENA—Municipality, ice arena, **$100,000.**

●Que., Quebec City — COLISEUM — Municipality, c/o F. X. Chounard, city clk., City Hall, plans by P. Rinfret, 400 Charest Blvd., Quebec City, coliseum, **$1,000,000.** Ed. Hamel, city engr.

Que., Val d'Or—SPORTS ARENA—Olympia Palace, Inc., Val d'Or, plans by J. C. Fortin, 240 Fourth Ave., sports arena, **$200,000.** CD 9/15/47—ENR 10/2/47, under Commercial Bldgs.

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Engineering Facts about

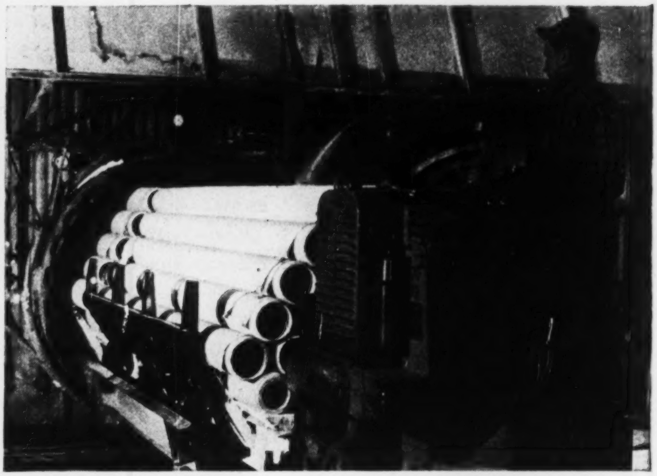
Johns-Manville TRANSITE* PRESSURE PIPE

Resistance to Corrosion

. . . an index of long life

Ability to withstand corrosion is the most important single measure of the durability or life expectancy of an underground water pipe material. Two factors—both inherent in the pipe itself—contribute to Transite's exceptional ability to resist corrosion. These are:

1. **The inherently corrosion-resistant materials of which Transite is made.**
2. **The specially developed manufacturing process — employed exclusively by Johns-Manville—which imparts a high degree of chemical stability to the finished product.**



A load of Transite Pipe about to enter the steam curing tanks. This step in the Johns-Manville manufacturing process contributes substantially to the corrosion resistance of the finished pipe—and, therefore, to its long service life.

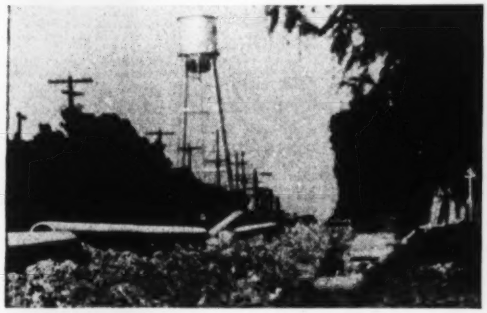
In the manufacture of Transite Pipe, the three basic ingredients, asbestos fibres, cement and silica—all basically corrosion-resistant by nature—are consolidated under tremendous pressure to form a pipe wall of dense, uniform, homogeneous structure. After forming, the pipe is subjected to a special steam curing process.

Transite Pipe was first used by this large west coast city in 1933. Its exceptional corrosion resistance—an index of long life—has already made it possible for Transite to outlive other pipe several times over.

It is in this steam curing stage that so much is contributed to the stability and structural integrity of the pipe. Here under the action of pressure steam, Transite assumes a new chemical identity. The silica unites chemically with the free lime ordinarily associated with cement products and converts it into highly stable calcium silicates. As a result of this process, the cured pipe is unusually resistant to corrosive attack throughout its entire structure.

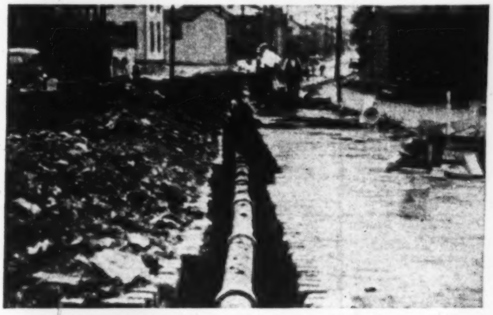
*Transite is Johns-Manville's registered trade mark for its asbestos-cement pipe and other products.

This intrinsic resistance to corrosion has been substantiated by numerous Transite installations. Some of these have been exposed to highly aggressive soils, both alkaline and acid, for many years. Many are now serving as replacements under conditions so destructive that the useful life of the pipe materials previously used had been seriously curtailed.



Transite Pipe was installed in this Texas city ten years ago to replace another pipe material that had been destroyed by soil corrosion in 7 years. The Transite mains are still on the job today with a long useful life ahead of them.

In one such installation, a Transite main installed during 1932 in an extremely corrosive soil was recently made the subject of careful study to determine its condition. Sections of the pipe, including couplings, were dug up and shipped to the factory for test. There was no evidence of deterioration. Pipe and couplings readily withstood the original factory pressure test, equivalent to four times the normal working pressure of the line.

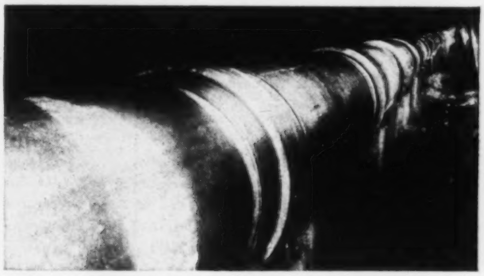


Like thousands of other communities, this West Virginia city selected Transite Pipe because it promised assurance of maximum life. Today, after 14 years of service, the first installation of Transite has already fulfilled this promise by outlasting the pipe material previously used.

Certain types of industrial service provide an even more severe "proving ground" for the life expectancy of pipe materials, and here, too, Transite Pipe has demonstrated exceptional corrosion resistance. Coal mine service is a typical example. Here acid mine waters are frequently so corrosive that they have destroyed ordinary pipe materials in a matter of a few months or years. Yet Transite Pipe has handled these same waters under working pressure up to 150 lbs. for periods from 10 to 15 years with little, if any, indication of deterioration.

Corrosive soil conditions were so severe at this location in a prominent New England city that the life of the pipe material formerly used was only 15 years. Transite Pipe, put in as a replacement in 1934, continues to give the same efficient, dependable service as the day it was installed.

To evaluate the ability of pipe materials to withstand soil corrosion, the National Bureau of Standards has conducted an extensive series of field tests. These studies are based on examination of hundreds of pipe samples periodically removed from severely corrosive soils. In these and similar tests, Transite Pipe has consistently demonstrated its superior resistance to soil corrosion, confirming the long life expectancy which this asbestos-cement pipe has evidenced in thousands of water works installations.



Transite's ability to provide long-term, dependable service is well illustrated by its performance in coal mines, where it consistently outlasts other pipe materials in carrying corrosive mine drainage waters. The 36" Transite line shown above has been conveying acid mine waters for 15 years.

For further details about Transite Pressure Pipe, write Johns-Manville, Box 290, New York 16, N. Y.

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PRODUCTS

CONSTRUCTION REPORTS-Second Section

Third Section Construction Reports on Page 121

WATER SUPPLY

BIDS ASKED

May 3

La., Amite—Town, Town Hall, water well, Porter, Barry & Switzer, 211 Main St., Baton Rouge, engrs.

May 4

Mass., Wrentham—Commonwealth of Mass., Dpt. Mental Health, Clifton T. Perkins, comr., 100 Nashua St., Boston, water sys. imprvs., standpipe, Contr. 1, State Proj. M-25, Wrentham State School. Plans deposit $10. Camp Dresser & McKee, 6 Beacon St., Boston, engrs.

S. C., Rock Hill—C. H. Albright, mayor, and City Council, City Hall, Div. 1, river intake and pump. station, 4 m.g.d. capacity, water filitration plant 4 m.g.d. capacity; Div. II, 3 raw water pumps, motors and controls; Div. III, 33,500 ft. 12 to 20-in. c.i. watermains, cleaning 7,000 lin. ft. 12 in. c.i. watermains; Div. IV, 1 m.g. steel tank and tower. Plans deposit $50. Approx. $28,000. Harwood Beebe Co., Montgomery Bldg., Spartanburg, engr. CD 11/13/46—ENR 11/28/46.

Que., Montreal—Executive Com., City Hall, supplying gate valves, for municipality. Plans deposit $25. H. A. Gibeau, city engr.

May 5

N. Y., New Scotland—New Scotland Town Bd., at office John C. White, town clk., Voorheesville, installing watermains, fittings, hydrants, valves, meter pit, connection to existing main, appurtenances, etc. Plans deposit $10.

May 9

●**Calif., Los Angeles**—Los Angeles Dpt. Water & Power, 207 S. Broadway, constr. Tunnels 1, 2, 3 and Surge Chambers 1, 2, and 3 Approx. $5,000,000. S. B. Morris, ch. engr. and genl. mgr. CD 1/15/45—ENR 1/25/45.

May 10

Tex., Grapevine—City, Gordon Tate, mayor, Grapevine, water well, appurtenances. $28,000. Plans deposit $25. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs.

May 11

Calif., Modesto—City, City Hall, 600,000 gal. elevated steel water tank, supporting tower, concrete fdns. Approx. $28,000. CD 12/20/46—ENR 1/9/47.

Mich., Detroit—Bd. Water Comrs., 506 Water Bd. Bldg., 735 Randolph St., Zone 26, Contr. Sect. 1. Northeast Tunnel, 5,851 lin. ft. 10 ft. tunnel, Pennsylvania Ave., to Gratiot Ave., 700 ft. northeast on Gratiot Ave., Contr. DWS 27. CD 11/11—ENR 11/25.

LOW BIDDERS

●**N. C., Winston-Salem**—City, Ralph L. Dixon, secy., Bd. Alderman, Apr. 7, from Lock Joint Pipe Co., 150 Rutledge Ave., East Orange, N. J., Contr. I, furnishing 36 in. concrete pipe, **$1,025,275*****from N. E. Brewer Co., Box 2860, Winston-Salem, Contr. II, install 36 in. concrete pipe, **$513,187;** Contr. XIII install 18 and 24 in. pipe, **$241,044*****from Blythe Bros. Co., 2911 Hutchinson Ave., Charlotte, Combination Contrs. I and II, furnish, install 36 in. concrete pipe, **$1,539,082;** Combination III and IV, furnish, install 48 in. steel pipe, **$322,825;** Contr. XIV, furnish, install 12 in. pipe, **$72,492*****from Bethlehem Steel Corp., E. 3 St., Bethlehem, Pa., furnish 48 in. steel pipe, **$194,040*****from D. W. Winkleman Co., Inc., 205 Harrison St., Syracuse, N. Y., Contr. IV, install 48 in. concrete pipe, **$134,080*****from V. B. Higgins Co., Greensboro, Contr. V and VI, pumping plant, **$129,490;** Contr. IX, filter plant, **$837,940*****from Chicago Bridge & Iron Co., 1305 W. 105 St., Chicago, Ill., Contr. VIII, stand pipe, **$73,700;** Contr. XXII elevated tank, **$179,900*****from Roberts Filter Mfg. Co., 611-13 Columbia Ave., Darby, Pa., Contr. X, mechanical on filter plant, **$348,800.** CD 3/9—ENR 3/17.

O., Columbus—Comrs. Franklin Co., Columbus, Apr. 7, watermain in vicinity of Harrisburg Pk. and Brown Rd., from General Constr. Co., 1221 E. 5 Ave., **$221,170.** Est. $282,700. D. T. Mitchell, co. sanitary engr.

CONTRACTS AWARDED

●**Calif., Los Angeles**—City Dpt. Water & Power, 207 S. Broadway, Franklin-Baldwin Trunk Line, Unit 1, rein.-con. pipe, to American Pipe & Constr. Co., South Gate, **$2,888,195;** Baldwin Outlet Line, rein.-con. pipe, to United Concrete Pipe Corp., Baldwin Park, **$2,088,355.** Bids 4/4. CD 4/11—ENR 4/14, under LB.

N. C., Ramseur—Town, Town Hall, Sect. 1, waterlines, to Z. A. Sneeden's Sons, 801 S. 16 St., Wilmington, **$28,051;** 200,000 gal. tank, to R. D. Cole Mfg. Co., Newman, Ga., **$36,100.** Bids 4/8. CD 3/30.

Tenn., Madison—Madison Suburban Utility Dist., Madison, steel water reservoir, 143 ft. in diam., to Chicago Bridge & Iron Co., 332 S. Michigan St., Chicago, Ill., **$110,000.** Hart, Freeland & Roberts, 3rd Natl. Bank Bldg., Nashville, archts.

SEWERS, WASTE DISPOSAL

BIDS ASKED

May 3

Ark., Booneville—State Tuberculosis Hospital, Booneville, sewerage sys. Max A. Mehlburger, Pyramid Bldg., Little Rock, engr. CD 11/2—ENR 11/11.

Mich., Detroit—City, City Hall, furnishing electric motor driven pump. equip. for Hubbel Sewer Pumping Station. CD 9/12/44—ENR 9/21/44.

Mich., Detroit — Dpt. P. Wks., City Hall, Lateral Sewer 6602, in blocks bounded by Barlow, Waltham, Sauer and Greiner Aves., Contr. PW-897; Lateral Sewer 6620, in blocks bounded by Shirley Ave., Schaefer Rd., Buena Vista and Tyler Aves., Contr. PW-911; Lateral Sewer 6622, in alley south of and parallel to Grand River Ave., from Salem Ave. to Telegraph Rd., Contr. PW-912. G. R. Thompson, city engr. CD 8/8/44—ENR 8/24/44.

Alta., Strathmore — W. B. Garnett, Town Hall, sewage disposal plant, sewers. Plans deposit $25. Haddin & Miles Ltd., Calgary, engrs.

May 4

Pa., Kutztown—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, sanitary trunk sewer at Kutztown State Teachers College. Plans deposit $2.50. Gilbert Assoc., 412 Washington St., Reading, engrs.

May 5

Mass., Boston—Metropolitan Dist. Comn., Wm.T. Morrissey, comr., 20 Somerset St., pump. equip., piping motor operated gate valves, electric control equip., stairs, imprvs., Deer Island Pumping Station. $100,000. Extended date. CD 3/29—ENR 3/31.

May 6

N. J., Hackensack—Bergen Co. Hackensack River Sanitary Sewer Dist. Auth., Bergen Co. Administration Bldg., Overpeck Valley Joint Sewage Works. Plans deposit $50 for Contr. 1. $10 for Contrs. 6-18. Bogert-Childs Engr. Assoc., 624 Madison Ave., New York 22, N. Y., engrs. CD 9/12/47—ENR 10/2/47.

S. C., Rock Hill—City, sanitary sewer imprvs. Plans deposit $10. Wiedeman & Singleton, Citizens and Southern Natl. Bank Bldg., Atlanta, Ga., engrs.

May 9

Ala., Prichard—City, sanitary sewer lines, service extens., manholes and lift station. Plans deposit $25. Ladd Eng. Co., 209 Wood Bldg., Ft. Payne, engr. CD 8/29/45—ENR 9/20/45.

May 10

N. J., Linden—Linden Roselle Sewerage Auth., Linden Public Library, Linden, Contr. 1A, approx. 460 ft. 60 in. rein.-con. sewer pipe, appurtenances across proposed State Hy. Route 100 and approach road thereto. Plans deposit $10. Alexander Potter Assoc., 50 Church St., New York 7, N. Y., consult. engrs.; adv. ENR 4/28. CD 2/18—ENR 3/17.

May 19

O., Dayton—At office Dpt. Service & Buildings, Municipal Bldg., Zone 2, 9,500 lin. ft. 7x4 ft. to 10x3 ft. rein.-con. box intercepting sewer, appurtenances. Plans deposit $15; adv. ENR 4/28. CD 10/23/45—ENR 11/15/45.

LOW BIDDERS

Conn., Bridgeport—City, F. Schwarzkopf, clk. Hy. Comn., City Hall, Apr. 11, storm and sanitary sewers, Iranistan Ave., from D' Addario Constr. Co., 810 Sylvan Ave., **$89,180.** CD 3/28—ENR 3/31.

Ga., Eatonton—City, cancelled bids to have been opened Apr. 21, sanitary sewer and WW imprv., **$200,000.** Project postponed. CD 4/8—ENR 4/14.

N. J., Pennsauken—Pennsauken Twp. Comn., Pennsauken, 2 sewage pump. stations, Contr. 5, from Acchione Contg. Co., 1607 McKean St., Phila., Pa., **$83,000;** sanitary sewers, various locations, Contr. 1, from C. & T. Constr. Co., 810 Haddon Ave., Collingswood, **$103,000.** J. C. Remington, 503 Cooper St., Camden, engr. CD 6/21/48—ENR 7/7/48.

R. I., Providence—Blackstone Valley Sewer Distr. Comn., A. A. Bonvicin, exec. secy., State Office Bldg., Apr. 20, Contr. 7, sewage plant serving Central Falls, Pawtucket, East Providence, Cumberland and Lincoln, from Gil Wyner Co. Inc., 12 Newland St., Malden, Mass., **$681,320.** CD 3/18—ENR 3/24.

CONTRACTS AWARDED

Mo., Kennett—City, J. W. Karsten, mayor, City Hall, storm sewers, ditches, appurtenances, to Paul Krummel, 7201 Weil Ave., St. Louis, Zone 19, **$94,200.** Bids 4/5. CD 3/25—ENR 3/31.

N. J., Livingston—Town, sewerage sys., to Frank Stamato & Co., 40 Sidney St., Lodi, **$117,431.** Bids 3/21. CD 3/15—ENR 3/17.

Pa., Lemoyne—Lemoyne Boro, sewerage sys., to Conduit & Foundation Corp., 770 Schuylkill Ave., Phila., Zone 46, **$727,423.** Bids 4/6, awarded 4/13. CD 4/13—ENR 4/21, under LB.

BRIDGES

BIDS ASKED

May 3

Pa., Scranton — Comrs. Lackawanna Co. Courthouse, reconstructing highway in Moosic Boro. $75,000. Samuel G. Mastriani c/o owner, engr. CD 4/15—ENR 4/21.

May 10

N. J., Bridgeton—Bd. Freeholders, Cumberland Co., Bridgeton, Commerce Street Bridge. $15,000. Edward H. Majer, co. engr. CD 2/17—ENR 2/24.

Ont., Kitchener—C. H. A. Stager, clk., Waterloo Co., Kitchener, Rau Bridge. $90,000. Plans deposit $50. D. J. Emrey, County Bldg., co. engr.

LOW BIDDERS

California—State Div. Hys., State Bldg., Los Angeles, Apr. 14, 2 rein.-con. bridges for overcrossings over Santa Ana Parkway and Inlet Ramp at Los Angeles St., Los Angeles Co., from J. E. Haddock, Ltd., 3578 E. Foothill Blvd., Pasadena, **$424,341.** CD 3/21—ENR 3/24.

†**Georgia**—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., cancelled bids to have been opened Apr. 28, Tanyard Creek Bridge Bartow Co., Serial No. Eng-01-076-49-136. CD 4/14—ENR 4/21.

Kentucky—State Hy. Dpt., Frankfort, rejected bids Apr. 8, bridge over Cumberland River at Loyall, Harlan-Pineville Rd., S. P. 48-168, Harlan Co., L. B. **$84,188.** CD 4/15—ENR 4/21.

Minn., Minneapolis—State Hy. Comr., St Paul, Apr. 8, 1,190 ft. Bridge 5591 consisting one 630 ft. beam span, retaining wall approaches, 60 ft. roadway and two 6 ft. sidewalks over Great Northern & Minneapolis & St. Louis R. R. tracks, 7 St. N. in Minneapolis, for City of Minneapolis, from W. D. Giertsen Co., 900 Glenwood Ave., **$942,184.** CD 3/23—ENR 3/31.

●**New York**—Bureau Contracts & Accounts, P. Wks., Albany, Apr. 20, 0.62 mi. Ontario Thruway separation of grades on Hopkins Rd. Vine St., N. Y. Central R. R., Buckley Rd., O. T. 49-3, Onondaga Co., from Carlo Bianchi & Co. Inc., Framingham, Mass., **$976,442** est. $1,117,000***0.22 mi. Cross Bronx Expressway (Cont. 2X) Highbridge Park Connection, FA. CBE, 49-3, New York Co. and 0.36 mi. Cross Bronx Expressway (Cont. 3) Washington Bridge alterations, FA. CBE 49-4, New York and Bronx Counties from Poirer & McLane, 33 W. 42 St., New York, **$1,088,259** est. $1,200,000 and **$736,996** est. $850,000 respectively*** 0.26 mi. City of Lockport, Lock St. and Gooding St. with New York Central R. R., PSC 7283, Niagara Co., from Metzger Constr. Corp., 429 Carlton St., Buffalo, **$525,183** est. $547,000 ***0.22 mi. elimination of Village Streets and Owego-Candor, Pt. 1. S. H. 5420 with Erie R. R., PSC. 7688, 8145, Tioga Co., from Harrison & Burrowes, 507 Summit Ave., Jersey City, N. J., **$778,000** est. $800,000. CD 4/6—ENR 4/14.

Virginia—State Hy. Dpt., Richmond, Apr. 14, bridge over Clinch River and approaches, Route 460, near Richlands, Tazewell Co., from F. L. Showalter, Lynchburg, **$65,110,** overpass and approaches at Norfolk and Western Ry. tracks, Route 460, Nottoway Co., from Garrett, Moon & Pool, Blackstone, **$90,217.** Alt. **$96,981** est. $90,217. CD 3/28—ENR 3/31.

CONTRACTS AWARDED

●**Georgia**—State Hy. Dpt., Atlanta, bridges, approaches on State Rt. 25, U. S. 17 the Coastal Hy. between Brunswick and Jacksonville, Fla. FI-432 (2) Camden Co., to H. G. Smith, Fitzgerald, **$158,936.** CD 3/9—ENR 3/17; under-

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

pass approaches, North Ave. under the Southern R.R. and the N. C. & St. Louis R.R., etc., Atlanta, FAGM WPGM 2588 (1), Fulton Co., to Wright Contg. 504 25 Ave., Columbus, **$935,961.** Bids 3/25, awarded 3/29. CD 3/16.

Kentucky—State Hy. Dpt., Frankfort, superstructure bridge across Cumberland River Monticello-Burnside Rd., S. P. SP 100-155, Pulaski Co., to Mt. Vernon Bridge Co., Mt. Vernon, O., **$680,795.** Bids 4/1. CD 4/15—ENR 4/21.

Mo., St. Louis—Terminal Railroad Assn. of St. Louis, Armstrong, Chinn, pres., Union Station, 1800 Market St., Zone 3, rein.-con. pedestrian underpass, under 20 St. to connect Union Station Midway with Terminal Parking law at 2029 Walnut St., to H. B. Deal & Co. Inc., 1218 Olive St., Zone 3, Approx. **$61,000.**

STREETS AND ROADS

BIDS ASKED

May 2

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, grading, curbing, recurbing, flagging and reflagging, asph. paving E. 54 St.; grading, curbing flagging where necessary, asph. paving E. 59 St.; curbing, flagging, asph. paving Glenwood Rd.; asph. resurfacing by heater method, Lewis Ave.; asph. repaving North Portland Ave. and Bushwick Ave. CD 8/28/44—ENR 9/7/44.

May 3

Newfoundland, St. Johns—J. J. Mahoney, city clk., 30,000 sq. yd. pavement, sidewalks, curbs, gutters, sewers, Water St., for Municipality. Grant R. Jack, city engr. CD 2/11—ENR 3/3.

O., Toledo—City, repairing, constructing approx. 216,900 sq. ft. sidewalk surface North, East and West Districts. $90,000. Thomas Reeves, sidewalk engr.

May 10

Tex., Seymour — City, City Hall, imprv., paving streets 68,000 sq. yd. asph. paving 8 in. gravel base; 8,000 lin. ft. concrete curbs, storm sewers. $100,000. Plans deposit $15. Joe E. Ward, 545 Nacol Bldg., Wichita Falls, engr. CD 12/13/45—ENR 12/27/45.

About May 15

Ala., Homewood—City, street imprvs. $125,000. Polk, Powell & Hendon, Chamber of Commerce Bldg., Birmingham, engrs.

May 24

†Alaska—Alaska Road Comn., Juneau, grading, bit. surf. 54 mi. Sect. B-1 of Glenn Hy. between Palmer and Copper Center. Plans deposit $10. CD 8/17/45—ENR 9/6/45.

LOW BIDDERS

California—State Hy. Dpt., State Bldg., Los Angeles, Apr. 14, plant mix surf. 1 mi. shoulders on imported subbase material and untreated rock base, plant mix resurf. existing pavement on Sepulveda Blvd. between Plaza St and East City limits of Culver City, Los Angeles Co., from J. E. Haddock, 3578 Foothill Blvd., Pasadena, **$72,671*****plant mix resurf. 3.4 mi. and place imported borrow shoulders apply bit. on Pioneer Blvd. and San Antonio Dr. between Orangethorpe Ave. and Firestone Blvd., Los Angeles Co., from John L. Swigart Co., P. O. Box 597, Torrance **$61,048*****road mix surf. 10.9 mi. Shavers Well and Desert Center and between 4 mi. west of Hopkins Well and Black Butte, Riverside Co., from Hensler Constr. Corp., 816 Allen Ave., Glendale **$64,980.** CD 3/23—ENR 3/31.

Georgia—State Hy. Dpt., Atlanta, cancelled bids to have been opened Mar. 25, paving 5.066 mi. Winder-Watkinsville Rd. to complete the paving from Winder to the Monroe-Athens Rd. on State Route 53, S-42 (2), Barrow and Oconee Counties; received no bids Mar. 25, 7.706 mi. wid'n. grading, paving and bridge on State Rt. 11 from 11 mi. north of Cleveland to Union Co. line, reconstr. narrow and winding-read leading to Neels Gap and Vogel State Park F-285 (2) and F-312 (2), Lumpkin Co. CD 3/9—ENR 3/17.

New Hampshire—State Hy. Dpt., Concord Apr. 14, grading, drainage, road mix surf. 2.618 mi. N. H. Route 12, in town of Westmoreland, Cheshire Co., from Lambert Constr. Co., White River Junction, Vt., **$390,002.** CD 4/4—ENR 4/7.

N. J., Cumberland—Bd. Freeholders, Cumberland Co., Bridgeton, road resurfacing various locations from George Slade, Dutch Neck Rd., Bridgeton, **$111,897.** Edward H. Maier, co. engr. CD 8/29/46—ENR 9/5/46.

†N. M., Los Alamos—U. S. Atomic Energy Comn., Los Alamos, Apr. 14, roads, concrete sidewalks, parking area, Inv. No. 291-49-127, from Jack Adams, Los Alamos, **$152,936.**

●New York—Bureau Contracts & Accounts, Dpt. P. Wks., Albany, Apr. 20, b. conc. resurf. 6.94 mi. Saranac Lake-Bloomingdale S.H. 821, Saranac Lake Village; Bloomingdale Village, S.H. 929, R. C. 49-36, Essex Co., from Louis Mayersohn, 36 State St., Albany, **$171,225** est. $172,000***bit. grav. 3.9 mi. Sodom-North Creek County Rd. 29, FA. SS. 49-4, Warren Co., from Carlo Bianchi & Co., Inc., Framingham, Mass., **$261,232** est. $275,000***constr. 4.46 mi. Northern Parkway, NSP 49-1, Suffolk Co., from Tuckahoe Constr. Co. Inc., 116 Columbus Ave., Tuckahoe, **$988,917** est. $1,000,000***b. conc. resurf. and wid'n. 4.85 mi. East Branch-Sullivan Co. line, Pt. 1, S.H. 5283, R.C. 49-20, Delaware Co., from Daniel F. McNamee Co., Inc., New Rochelle, **$134,734** est. $155,000***b. conc. resurf. 3.51 mi. Copenhagen S.H. 937, R.C. 49-17, Lewis Co., from Ador & Booth, Watertown, **$86,509**

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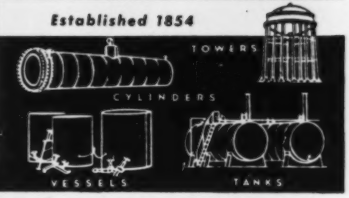

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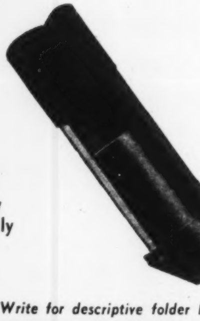

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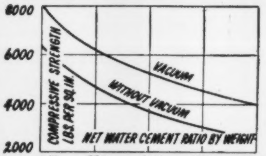

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est. $98,000***b. conc. resurf., wid'n. 2.81 mi. Oxford-Chester S.H. 5297, R.C. 49-43, Orange Co., from Louis Argenio, Inc., Newburgh, **$142,215** est. $143,000.

b. conc. resurf. and wid'n. 3.83 mi. New Jersey State Line-Congers, Pt. 1, S.H. 8448, Congers-Long Clove S.H. 5002, Rockland Lake-Long Clove S.H. 8196, R.C. 49-44, Rockland Co., from Ward Bros., Inc., Lower West, Haverstraw, **$113,790** est. $114,000***b. conc. 6.31 mi. Hudson-Brick Tavern-Ghent S.H. 9087, R. C. 49-45, Columbia Co., from Hudson River Constr. Co. Inc., 75 State St., Albany, **$218,269** est. $282,000 ***bit. macad. resurf. 5.68 mi. Adamsville-Hartford S. H. 8101, R.C. 49-37, Washington Co., from Louis Longhi & Son, Glens Falls, **$134,985** est. $147,000***misc. constr. 4.36 mi. Southern State Park, SSP 49-1, Nassau Co., from John C. Peterson Constr. Corp., 113 S. Grand Ave., Baldwin, **$987,881** est. $1,000,000*** b. conc. reconstructing 2.55 mi. Main St. Pts. 3 and 4, S.H. 130 and 131, R.C. 49-22, Erie Co. and bit. macad., b. conc. and surf. tr. 6.17 mi. North Clymer-Sherman S.H. 8468, R.C. 49-40, Chautauqua Co., from John F. Kendall Co., 1758 Walden Ave., Buffalo, **$82,942** est. $102,000 and **$152,395** est. $188,000 respectively.

b. conc. reconstructing 3.36 mi. Cohocton-Naples, Pt. 1, S.H. 5611, R.C. 49-41, Steuben Co., and b. conc. wid'n and resurf. 3.82 mi. Horseheads-Corning S.H. 358, Horseheads-Cayuta S.H. 5432A, R.C. 49-42, Chemung Co., from A. L. Blades & Sons, Hornell, **$153,960** est. $202,000 and **$141,650** est. $157,000 respectively***b. conc. resurf. 8.52 mi. Cranberry Lake-Seveys Corners S.H. 8220, R.C. 49-18, St. Lawrence Co., from Warren Bros. Roads Co., 38 Memorial Dr., Cambridge, Mass., **$202,962** est. $276,000*** b. conc. resurf. 4.76 mi. Old Forge-Eagle Bay, Pts. 1 and 2, S.H. 8180, R.C. 49-38 Herkimer Co., from Eastern Rock Products, Inc., 404 Court St., Utica, **$131,570** est. $134,000***reconstructing 1.49 mi. South S.H. 223, FA. RC. Dutchess Co., from Berlanti Constr. Co., Inc., 15 Oakland Ave., Harrison, **$432,345** est. $465,000. Received no bids Apr. 20, constructing new location 0.58 mi. Cross County Parkway to Hutchinson River Parkway (Wartburg Connection), CCP 49-1, Westchester Co., **$1,429,000.** CD 4/6—ENR 4/14.

Ohio—State Hy. Dpt., T. J. Kauer, dir., Columbus, Zone 15, rejected bids Apr. 12, bit. 19.08 mi. Proposals 1 to 6 (inclusive) Portage, Stark and Summit Counties. **$72,293.** CD 3/24—ENR 3/31.

Virginia—State Hy. Dpt., Richmond, Apr. 14, c. conc. 2.02 mi. and bridge Route 134, Elizabeth City Co., from T. E. Ritter Corp., 426 W. York St., Norfolk, **$286,128*****water-bound macad. 0.75 mi. and bridge Route 52 from 1.08 mi. south of Jackson Ferry, Carroll and Wythe Counties, from Adams & Tate Constr. Co., 2725 Roanoke Ave., Norwich, Roanoke, **$74,242*****stabil. base wid'n. 1.83 mi. Routes 31 and 602 at Williamsburg, James City Co. from H. G. Mc Cartney Co., Toano, **$96,467*****c. conc. 1.56 mi. Route 641 from Int. Route 58 to Route 641, Southampton Co., from W. H. Scott, Inc., Franklin, **$76,069***** stabil base surf. tr. soil cement of Type B 1, 5.31 mi. Routes 600 and 604 from 0.04 mi. south Int. Rt. 26, Appomattox Co., from Roy M. Homewood, Chapel Hill, **$55,219*****c. conc. paving 2.93 mi. 2 and 4 Lane Pl. Route 13, Accomack Co. from Bero Eng. & Constr. Corp., Hampton, **$340,306*****c. conc. paving 0.75 mi. and bridge on Route 13, Princess Anne and Norfolk Counties, from Ames & Webb, Inc., 3195 Broad Creek Rd., Norfolk, **$210,295.** Received no bids Apr. 14, 0.62 mi. concrete sidewalk at Buckingham Court House, Buckingham Co. CD 3/28—ENR 3/31.

Wis., Milwaukee—City, City Hall, 200 E. Wells St., Apr. 12, asph. paving W. Wells St., from Wm. F. Hunt & Co., 2808 N. Sherman Blvd., Zone 10, **$248,665.** W. Windlake Ave., from Schneider-Borchert Co., 606 W. Wisconsin Ave., Zone 3, **$88,547.** CD 4/7.

Puerto Rico—Bd. Awards of Contracts, Insular Dpt. of Interior, Jorge J. Jimenez, comr. Interior, and Thomas A. Jones, of Pub. Roads Admin., Santurce, construct 4.12 kilometers c. conc. highway of first sect. of Caguas-Rio Piedras Rd., from Rexach & Rivera Constr. Co., Puerto Rico, **$494,362.** CD 9/24/45—ENR 10/4/45.

CONTRACTS AWARDED

Connecticut—State, G. Albert Hill, comr., Hartford, c. conc. 4 mi. Wilbur Cross Parkway from Derby Ave., Orange to West Rock Tunnel, New Haven, to M. A. Gammino Constr. Co., 728 Valley Rd., Providence, R. I., **$599,289.** Bids 4/4. CD [illegible]/7—ENR 4/14, under LB.

Georgia—State Hy. Dpt., Atlanta, grading, surf. 2.589 mi. Melo to Ala. State Line Post Rd., S-358 (1), Chattooga Co., to Couch Constr. Co., Dothan, Ala., **$66,506*****paving 10.475 mi. Buena Vista-Geneva Rd. to complete the paving between Manchester and Buena Vista on State Rt. 41, S-2643 (2), Marion and Talbot Counties, to Coffee Constr. Co., Eastman, **$125,885*****base surf. and tr. 4.09 mi. State Rt. 2 US 76 to complete paving road between Clayton and S. C. State Line F-561 (33), Rabun Co., to Ledbetter-Johnson Co., Rome, **$65,557.** Grand total $257,948. Bids 3/25, awarded 3/29. CD 3/9—ENR 3/17.

●**Ill., Chicago**—City of Chicago, Dpt. Purchases, Contracts, & Supplies, City Hall, rein.-con. imprv. W. Randolph St. to W. Lake St., Sect. 1212.1, Wacker Dr. Extens., to Herlihy Mid-Continent Co., 79 W. Monroe St., **$1,052,493.** Bids 2/24. CD 3/1—ENR 3/3, under LB.

Kentucky—State Hy. Dpt., Frankfort, bit. surf. Class I 12.069 mi. Bear Wallow-Canmer Rd., S. P. F. 28 (5) F. 7 (5); SP (5-12) (50-40); Barren and Hart Counties, to Waters Constr. Co., Elizabethtown, and R. E. Gaddie, Bowling Green. **$503,748.** Bids 4/1. CD 4/15—ENR 4/21.

Mich., Detroit—Dpt. P. Wks., 104 City Hall, street paving, Contrs. P. W. 740, 745, 746, 756, and 796, Group 49-8, to Denton Constr. Co., 7-170 General Motors Bldg., **$103,795*****Contrs. P. W. 780, 781, 782, 784, 786, 788, 789, and 790, to Weir Contg. Co., 7405 Joseph Camp, **$103,203.** Bids 4/5. CD 3/30.

Mich., Detroit—Dpt. P. Wks., City Hall. Mar. 29, imprv. streets, P. W. 704, 707, 749, 754, 761, 762 and 765, to Thomas Currie Co., 2531 Connor St., **$132,074;** P. W. 705, 711, 748, 750, 751, 752, 759 and 764, to A. J. Smith Contg. Co., 4947 Schafer St., **$108,758.**

Neb., Kearney—City, paving, to Ralph Green & W. L. Groesback, 312 Masonic Temple Bldg., Des Moines, Ia., **$138,902.** Bids 4/6.

Neb., Omaha—City, City Hall, street repairs, to National Constr. Co., 1335 S. 20 St., **$128,734.** Bids 3/15. E. W. Woodbridge, city engr. CD 5/17/48—ENR 5/27/48.

●**New York**—Bureau Contracts & Accounts, Albany, reconstructing 10.94 mi. Route 52, Ellenville to Woodbourne, Ulster and Sullivan Counties, to Berlanti Constr. Co., 15 Oakland Ave., Harrison, **$1,296,936.** Bids 3/1. CD 3/14—ENR 3/17, under LB.

Ohio—State Hy. Dpt., T. J. Kauer, dir., Columbus, Zone 15, bit. 31.81 mi. Proposals 1 to 9 (inclusive) Mahoning and Portage Counties, to The City Asphalt & Paving Co., 120 Pike St., Youngstown, **$76,399*****bit. 27.95 mi. Proposals 1 to 4 (inclusive) Fairfield and Perry Counties, to A. W. Burns Constr. Co., 424 Woodland Ave., Columbus, **$63,846*****bit. tr. 32.38 mi. Proposals 1 to 6 (inclusive) Carroll and Columbian Counties and bit. tr. 14.91. Proposals 1 to 4 (inclusive) Ashtabula Co., to Hull Resurfacing Co., 329 Pillow St., Butler Pa., **$77,795** and **$73,456** respectively ***bit. tr. 25.67 mi. Proposals 1 to 4 (inclusive) Ashland Co., to Walter H. Jones, Route 1, Wooster, **$66,689*****bit. tr. 19.33 mi. Proposals 1 to 6 (inclusive) Ashland and Lorain Counties, to H. J. Hart, P. O. Box 395, Elyria, **$52,651** ***bit. tr. 45.69 mi. Proposals 1 to 10 (inclusive) Belmont and Harrison Counties, to Edgar Spring, Inc., Box 177, New Philadelphia, **$108,054.** Grand total $518,890. Bids 4/12.

O., Cleveland—Comrs. Cuyahoga Co., Courthouse, Lakeside St. and Ontario Ave. bit. conc. 1½ mi. Bartlett Rd. from Aurora to Cols. Rds. incl. water proof coating at Bedford, to O'Neill Road Constr. Co., 437 Trumbull Ave., **$118,000,** est. $134,500. Awarded 4/14. Albert S. Porter, Standard Bldg., co. engr. CD 11/12/43—ENR 11/18/43.

●**Pennsylvania**—Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg, grading, drainage, structures, paving 4.66 mi. Turnpike Sect. 23-A, part of Philadelphia exten., in lower Swatara and Londonderry Twps., Dauphin Co., to C. J. Langenfelder & Son, Inc., 8427 Pulaski Hy., Baltimore, Md., **$2,509,828.** Bids 4/11. CD 4/13—ENR 4/21 under LB.

Utah, Salt Lake City—City, c/o Irma Bitner, recdr., City and County Bldg., sidewalk, curb and gutter in Sidewalk Dist. 110, 19 East, 20 East and Preston Aves. from 21 South to Parleys Canyon Blvd., 18 East from Michigan Ave. to 13 South and Elizabeth St. from 7 to 8 South Sts., to Gibbons & Reed Co., 259 W. 3 South St., **$82,606.** Bids 3/30. CD 11/16/45—ENR 11/29/45.

Washington—State Hy. Dpt., Olympia, c. conc. 3.198 mi. Primary State Hy. 2, Cle Elum, Kittitas Co., to Asphalt Paving & Engr. Co., P. O. Box 106, South Tacoma, **$252,909***** stockpiling and bit. surf. tr., plant mix Type F, 13.772 mi. Primary State Hy. 3, Colton to Pullman, Whitman Co., to McAtee & Heathe, E. 3527 Trent St., Pullman, **$178,039***** grading, draining, rein.-con. bridge 1.604 mi. Primary State Hy. 16, Pateror to Black Canyon Sect. 4, E. R. P. No. ER-4F-4 (1), Unit 3, Okanogan Co., and grading, draining 2.188 mi. Primary State Hy. 16, Methow to Twisp, Sects. 2, 3, and 4, E. R. P. No.s ER-4 (6), Unit 1, ER-4 (8), Unit L and ER-4 (9), Unit 1, Okanogan Co., to C. E. Oneal, Ellensburg, **$100,514** and **$192,727** respectively. Grand total $724,189. Bids 4/15.

EARTHWORK, WATERWAYS

BIDS ASKED

May 3

Mich., Sandusky — Sanilac Co., Sandusky, Lapeer Co., Lapeer, and St. Clair Co., Port Huron, 47,600 ft. Black River Inter-County Drain, near here, $50,000.

†**Nevada** — Bureau Reclamation, Dpt. Interior, Boulder City, 2 safety bulkheads, 2 safety doors and 2 safety gates for Hoover Power Plant, Boulder Canyon Proj., Spec. R3-B7.

May 4

N. S., Lunenburg—J. M. Somerville, secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater reconstruction, Approx. $60,000. Plans deposit $20. R. Blais, c/o owner, engr.

N. S., Port Monton—Secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater replacement. Approx. $50,000. Plans deposit $20. R. Blais, c/o owner, engr.

†**Kentucky**—U. S. Eng., P. O. Box 2127, Huntington 18, W. Va., installing drains and re-

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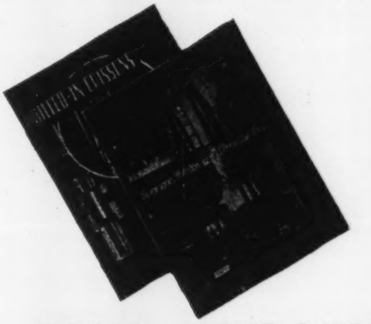

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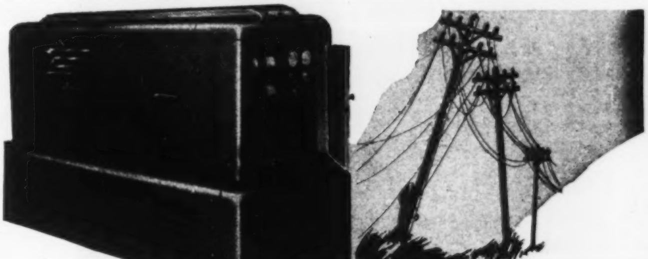

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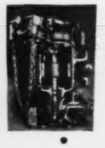

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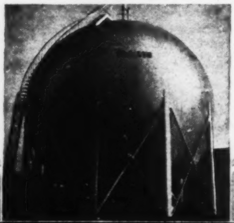

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pairing esplanade, Lock 31, Ohio River, Lewis Co., Serial No. Eng-46-022-49-125. CD 7/23—ENR 7/29.

†Missouri and Kansas—U. S. Eng., 601 Davidson Bldg., Kansas City, Mo., clearing, grubbing, levee embankment, drainage structures, channel excav., rip-rap protection, Levee Unit 440-R, Atchinson and Doniphan Counties, Kan., and Buchanan Co., Mo., Serial No. 23-028-49-149. CD 1/27—ENR 2/3.

May 6

†Florida—U. S. Eng., P. O. Box 1169, Mobile 7, Ala., navigation lock and fixed crest spillway at Jim Woodruff Dam Chattahoochee, Serial No. Eng. 01-076-49-106. Extended date. CD 2/7—ENR 2/17.

Kan., Great Bend—State of Kansas, Forestry, Fish & Game Comn., at office D. Leahy, dir., Pratt, Cheyenne Bottoms Inlet Canal, Barton Co., near here. Plans deposit $10. Wilson & Co., 223 N. Santa Fe St., Salina, engrs.

On or about May 10

†Georgia—U. S. Eng., P. O. Box 1169, 2301 Grant St., Mobile 7, Ala., saddle dikes and plug dam near Allatoona Dam, Etowak River, Serial No. Eng-01-076-49-140.

May 10

†Arizona-Nevada — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver Colo., steel structures for Parker-Gila, Drop No. 4, Tap, Davis Dam Proj., Spec. 2637. L. N. McClellan, ch. engr.

May 17

†North Dakota—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., excavation work, placing compacted earthfill embankment, construct concrete spillway, placing protection stone, topsoiling and seeding and appurtenances, Homme Dam, Stage No. 2, spillway and embankment closure, Park River, Serial No. Eng-21-018-49-85; adv. ENR 4/28. CD 4/18—ENR 4/21.

LOW BIDDERS

†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Apr. 8, completion Granby Pump Canal, Station 111 plus 00 to Station 158 plus 70, Colorado-Big Thompson Proj., about 12 mi. north of Granby, Spec. 2554, from Granby Constructors, Colorado Springs, **$304,750.** CD 3/15—ENR 3/17.

●†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., Apr. 19, earthwork, concrete lining, structure, and access road, Horsetooth Feeder Canal, Station 67 plus 52.1 to Station 475 plus 61.0 exclusive of Tunnels 2, 3 and 4, about 8 mi. west of Leveland to about 6 mi. southwest of Ft. Collins, Larimer Co., Colorado-Big Thompson Proj., Spec. 2613, from Western Paving & Constr. Co., 5230 Washington St., Denver, Schedule 1, **$2,341,290.** CD 3/25—ENR 3/31.

†Nebraska and Kansas—Bureau Reclamation, Dpt. Interior, Superior, Neb., Apr. 14, earthwork, canal lining and structures for Superior Canal, Station 10 plus 00 to 659 plus 50, Pawnee Lake wasteway, channel changes and intercepting drains, Missouri River Basin Proj., Bostwick Unit, Spec. 2598, from Knisely-Moore Co., Douglas, Wyo., **$597,615.** CD 3/15—ENR 3/17.

†Washington — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., rejected bids Feb. 24, electric elevators for Grand Coulee Pumping Plant, at Grand Coulee Dam, about 30 mi. northeast of Odair, Spec. 2543, L. B. **$158,500.** CD 3/2—ENR 3/10, under LB.

CONTRACTS AWARDED

Ind., Huntington—Huntington Co., Huntington, ditching Little River, east city, from point near Broadway at eastern edge of Huntington to Little and Aboite Rivers, Allen Co., to Robert E. Green Constr. Co., Oaktown, **$164,001.** L. L. Buzzard, co. surveyor, engr.

†North Dakota—U. S. Eng., Fort Lincoln, Box 300, Bismarck, penstock gates for Garrison Dam Proj., Eng-32-015-49-68, to Westinghouse Electric Corp., 2303 N. E. Kennedy St., Minneapolis, Minn., **$469,440.** Bids 3/18.

†Oregon — Bureau Reclamation, Dpt. Interior, Klamath Falls, earthwork and structures for Lost River diversion channel enlargement from Lost River to Klamath River, Klamath Proj. Tule Lake Div., Spec. 2582, to George R. Stacey, Tulelake, Calif., **$537,292.** Bids 3/25, awarded 4/15. CD 4/4—ENR 4/7, under LB.

●Pennsylvania—Forests & Waters, 404 Education Bldg., Harrisburg, dredging, floodway clearing and excav. River Sects. 4 and 2 of Schuylkill River Desilting Proj., Berks Co., to Eastern Eng. Co., 4 N. North Carolina Ave., Atlantic City, N. J., **$2,493,400** est. $2,500,000 and **$4,093,825** est. $2,500,000 respectively. Bids 3/29, awarded 4/12. CD 4/4—ENR 4/7, under LB.

●Pennsylvania—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, construct Auburn Desilting Basin 1, on Schuylkill River between Auburn and Landingville, Schuylkill Co., to Arthur A. Johnson Corp., Sunbury, **$1,481,000.** Est. $2,500,000. Bids 3/30, awarded 4/12. CD 4/5—ENR 4/7, under LB.

AIRPORTS AND AIRBASES

BIDS ASKED

May 4

†Va., Chincoteague — SPRINKLER SYSTEMS—Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, automatic sprinkler systems at Naval Auxiliary Air Station, Spec. 22068. Plans deposit $10.

May 5

N. H., Keene—AIRPORT—City, airport, installing airport lighting sys., incl. obstruction lights and beacons etc., at Dillant-Hopkins Airport, at Swanzey. Plans deposit $25. Fay, Spofford & Thorndike, 11 Beacon St., Boston, Mass., engrs. CD 1/8/45—ENR 1/25/45.

May 9

†R. I., Quonset Point—OVERHAUL and REPAIR BLDG.—Officer Charge of Construction, Naval Air Bases, First Naval Dist., Pub. Wks. Bldg., U. S. Naval Air Station, engine overhaul extens. to Overhaul and Repair Bldg. 60, Spec. 22366. Plans deposit $80.

May 10

†Calif., Point Mugu — MESS HALL, etc. — Office of Officer-in-Charge of Constr., U. S. Naval Air Missile Test Center, mess hall and galley, 20,000 sq. ft. floor space, Spec. 22226. Plans deposit $30.

LOW BIDDERS

Mich., Port Huron—AIRPORT—St. Clair Co., Court House, clearing, grubbing, drainage, paving, appurtenances, from Coe & Shingledecker, Inc., 3025 Lapeer Rd., R. F. D. 1, Pontiac, **$129,173.** CD 1/14/47—ENR 3/6/47.

Tex., Amarillo — AIRPORT IMPRVS. — City, N. V. Moss, mgr., Apr. 12, municipal airport imprvs., incl. runway and taxiway extens., storm sewer, lighting sys., grading, levelling, open drainage, terminal, etc., from Bell, Braden, Barker & Gilvin, Inc., Amarillo, **$290,876.** Est. $75,000. CD 3/23—ENR 3/31.

†Va., Norfolk — PAVING — Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Zone 11, cancelled bids to have been opened Apr. 20, paving preservation area at Naval Air Station, NOY 18523, Spec. 22328. CD 4/14.

CONTRACTS AWARDED

Neb., Hastings — AIRPORT — City, airport imprvs., to Abel Constr. Co., 895 N. 16 St., Lincoln, **$240,000.** CD 7/17/47—ENR 8/7/47.

●N. Y., Idlewild — AIRPORT — Port of New Auth., 111 8 Ave., New York, Zone 11, electrical conduits and manhole constr. at International Airport, to Johnson Electrical Corp., 579 Avenue of the Americas, New York, **$1,196,612.** Bids 12/28. CD 12/16—ENR 12/23.

●†Alaska—AIRPORT IMPRVS.—U. S. Eng., Pier 51, Seattle, Wash., enlisted men's barracks and mess hall at Eielson Air Force Base, to S. Birch & Sons Constr. Co., Central Bldg., Seattle 4, Wash., **$738,985** est. $916,853; outside facilities at Fort Richardson, S-95-507-49-17, to Morrison-Knudsen Co. Inc., 319 Broadway, Boise, Idaho, **$1,588,584.** Bids 4/6. CD 3/14—ENR 3/21, under LB.

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Chile—Corporacion de Fomento de La Producion, Santiago, 42½ mi. 8 in. crude oil pipeline from Cerro Manantiales and Galeta Clarencio, force account. Approx. **$750,000.** Williams Bros. Co., Santiago, Chile, engr. CD 5/29/47—ENR 6/12/47.

Venezuela—Creole Petroleum Corp., Caracas, receiving bids 61½ mi. 30 and 4 in. waterline from Siburua Springs to Amuay Bay on Paraguan Peninsula, $900,000; 10.3 mi. 8 in. products line Catia de la Mar to terminal at Nuevo Caracas, $175,000. CD 10/4/46—ENR 10/17/46.

PUBLIC BUILDINGS

BIDS ASKED

After May 1

●**N. C., Chapel Hill**—University of North Carolina, W. Reese, Berry Hill, dean, Chapel Hill, 400 bed hospital alterations, addns. to Medical School. Approx. $5,000,000. Northrup & O'Brien, Reynolds Office Bldg., Winston-Salem, archts. CD 3/2/48—ENR 3/11/48.

May 3

●**Mich., Flint**—Genesee Co., Flint, 5 story tuberculosis sanitarium, $1,250,000. Malcomson, Fowler & Hammond, 1219 Griswold St., Detroit, Zone 26, archts. CD 3/22/46—ENR 6/13/46.

May 4

Conn., Storrs—State, G. Albert Hill, hy. comr., State Capitol, Hartford, 90 duplex, cinder block, precast concrete apartments, brick faced, University of Connecticut, $800,000. Plans deposit $50. CD 3/28.

May 5

●**Tenn., Chattanooga**—Hamilton County Memorial Hospital c/o Kaiser, Neal & Reid, archts., Keystone Bldg., Pittsburgh, Pa., hospital. Approx. $1,000,000. Extended date. Wm. A. Martin, James Bldg., assoc. archts. CD 4/8—ENR 4/14.

May 12

●**Tenn., Johnson City**—Appalachian Memorial Hospital Assn., c/o Charles H. McCauley, archt., Jackson Bldg., Birmingham, Ala., hospital. Approx. $1,000,000. Extended date. CD 10/7—ENR 10/14.

May 17

●†**N. Y., Brooklyn**—U. S. Eng., 120 Wall St., New York, Zone 5, family type living quarters at Fort Hamilton. $1,370,000.

May 26

Ga., Thomaston — Upson Co., Thomaston, hospital, $915,000. Plans deposit $50. W. J. J. Chase, 140 Peachtree St., Atlanta, archt. CD 2/21—ENR 3/3.

June 1

●**Ala., Decatur** — City, Junior-Senior High School. $1,000,000. Raymond Sizemore, 16 S. Hull St., Montgomery, archt. CD 12/9/48—ENR 12/23/48.

LOW BIDDERS

Calif., Martinez — Contra Costa Co., Hall of Records, Apr. 18, 2 story, rein.-con. juvenile hall, from Haas & Rothschild, 274 Brannan St., San Francisco, **$657,700.** CD 3/22—ENR 3/24.

●†**Ky., Fort Knox**—U. S. Eng., 830 W. Broadway, Louisville, Apr. 15, fourteen 2 story brick, concrete houses, incl. waterlines, sewers, roads, walks, etc., from Struck Constr. Co., 147 N. Clay St., Louisville, **$1,477,069.** CD 3/17—ENR 3/24.

Mo., Jefferson City—Lincoln University, Jefferson City, Apr. 14, two 4 story, 48x133 ft., brick, concrete, stone boys dormitories, from George E. Baumann, 713 E. Austin St., Nevada, **$563,688.** CD 3/29—ENR 3/31.

●**N. Y., Great Neck**—Bd. Educ., Union Free School Dist. 7, Apr. 19, Saddle Rock School, Bayview Ave. and Hawthorne Lane, from William A. Berbusse Jr., Inc., 101 Park Ave., New York, Zone 17, **$1,299,000.** CD 3/23—ENR 3/31.

●**N. Y., New York**—Port of New York Auth., 111 Eighth Ave., Zone 11, Apr. 20, steel work for bus terminal contr. Bt-3 from Harris structural Steel Co., 419 4 Ave., **$1,931,130.** CD 3/24—ENR 3/31.

●**Pa., Chambersburg** — Chambersburg Hospital, c/o H. W. Hunt, Chambersburg, Apr. 20, brick, steel hospital, from McClosky & Co., 1620 W. Thompson St., Phila., **$1,026,000.** CD 4/5—ENR 4/7.

Tenn., Cookeville—City, Apr. 12, 50 bed hospital, from F. E. Hicks Co., Flatiron Bldg., Knoxville, **$412,467.** CD 3/16—ENR 3/24.

●†**Tenn., Oak Ridge** — U. S. Atomic Energy Comn., P. O. Box 365, Attention Community Constr. Sect., Oak Ridge, Apr. 13, 286 duplex dwelling units in Neighborhood 10, Inv. No. 401-49-10 A, Projects 1 and 2, from T. C. Bateson Constr. Co., Irwin-Keasler Bldg., Dallas, Tex., **$1,599,492.** CD 3/9—ENR 3/17.

Puerto Rico—Puerto Rico Housing Auth., San Juan, Apr. 12, 164 low rent units at Mayaguez, from Jorge Rosso, Puerto Rico, **$517,500.** CD 4/13/44—ENR 4/20/44.

CONTRACTS AWARDED

Ia., Ames—City, City Hall, power plant imprvs., Contrs. 16 and 17, furnishing ornamental steel and iron, and construction same, to Interstate Constr. Co., 3621 Troost St., **$800,000.** Bids 4/4. CD 3/30.

●**Minn., Mankato**—Bd. Educ., Loretta M. Veigel, clk., general contract high school, to

15,000 *V.P.M.*

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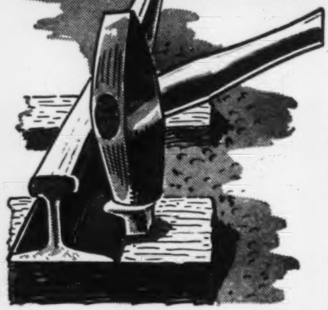

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Hagstrom Constr. Co., 1567 Selby Ave., St. Paul, **$1,223,400.** Bids 4/6. CD 4/12—ENR 4/14.

N. J., Bordentown — City Comn., 96 family garden type housing, to Twentieth Century Constr. Co., 27 and Marlton Pike, Penn Twp., Camden, Approx. **$750,000.** Edwards Green, Broadway and Carman Sts., Camden, archts.

●N. J., Paramus — Bergen Co., Admin. Bldg., Hackensack, general contract (exclusive of tunnel) hospital, to Daniel J. Cronin, 717 S. Orange Ave., Newark, **$2,129,460*****plumbing and heating, ventilating, air-conditioning and sprinklers, to Frank A. McBride Co., 160 Ward St., Paterson, **$353,180** and $432,737 respectively***structural steel, misc. iron, to Harris Structural Steel Co., 419 4 Ave., New York, N. Y. **$368,800*****electrical work exclusive of outside distr. sys. and lighting for utility tunnel, to A. Neri, Inc., 614 Clinton St., Hoboken, **$211,878.** Grand total $3,496,064. Bids 4/4. CD 3/7—ENR 3/10.

O., Howland — Bd. Educ., Howland-Howland Junior-Senior High School, to W. B. Gibson Co., Warren, **$489,000.** Bids 3/29. CD 4/5—ENR 4/7, under LB.

●†Tenn., Oak Ridge—U. S. Atomic Energy Comn., P. O. Box 365, 286 duplex dwelling units, Permanent Housing Group 4, to T. C. Bateson Constr. Co., Irwin-Keasler Bldg., Dallas, Tex., **$1,658,195.** Bids 4/13. CD 4/20—ENR 4/28, under LB.

●†Alaska, Whittier—U. S. Eng., APO 942, c/o P. M., Seattle, Wash., bulk fuel facilities, incl. wharf, pipelines, and tank farm to Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, **$2,017,825.** Bids 4/6. CD 2/14—ENR 2/17.

●Alta., Edmonton—Province of Alberta, Edmonton, Aberhart Memorial Hospital, to Poole Constr. Co. Ltd., 218 Tegler Bldg., **$1,458,416.** Bids 4/8. CD 3/25—ENR 3/31.

●Ont., Ottawa — Royal Ottawa Sanatorium, Carling Ave., S. M. Clarke, chn. Bd. Trustees, 4 story, bsmnt., wing, service bldgs., boiler and laundry bldg. addn., tunnel connecting bldgs., Tuberculosis Hospital, to A. I. Garvock & Co., Regent Theatre Bldg., Sparks and Dank Sts. Approx. **$1,000,000.** CD 1/14/46—ENR 2/7/46.

COMMERCIAL BUILDINGS

BIDS ASKED

About May 3

●Ia., Waterloo—Scholtz Memorial Hospital, Bd. Trustees, Presbyterian Hospital Assn., Waterloo, brick, concrete, hospital. $1,500,000. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Zone 3, Ill., engrs. and archts. CD 4/7—ENR 4/14.

Bids Asked

Pa., Allentown—Cedar Crest College, Allentown, concrete block, stone, brick arts bldg. $350,000. H. F. Everett & Assoc., Allentown, archts.

Alta., Edmonton—Owner, c/o Stanley & Stanley, archts., 10020 Jasper Ave., 34 unit apartment. Approx. $250,000.

SOON LETS CONTRACT

Ala., Cullum — Seventh Street Baptist Church, c/o Charles H. McCauley, archt., Jackson Bldg., Birmingham, soon lets contract church. CD 3/16—ENR 3/24.

La., Crowley—American Legion Hospital, c/o Clayton J. D'Avy, Jr. & Assoc., archts., Opelousas, soon lets contract hospital. CD 4/1—ENR 4/7.

Mass., West Springfield—The Ballinger Co., archt., 121 N. Broad St., Phila., Pa., soon lets contract, department store, for Sears Roebuck & Co., Roosevelt Blvd. and Adams Ave., Phila. Pa. CD 1/26—ENR 2/17.

Mo., St. Louis—St. James Catholic Parish, Rev. P. J. O'Connor, pastor, 1349 Tamm Ave., Zone 10, soon lets contract 2 story, 35x92 ft. and 38x55 ft. L-shaped brick, concrete parochial school, 1358 Tamm Ave. Carroll & Dean, 5473 Delmar Blvd., Zone 12, archts.

N. C., Hendersonville—Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga., soon lets contract dial and toll office bldg. Approx. $250,000. J. N. Pease Co., 119¼ E. 5 St., Charlotte, archts.

LOW BIDDERS

Calif., Los Angeles—University of Southern California, 3551 University Ave., Apr. 14 4 story, rein.-con. College of Letters Arts and Science bldg., from J. A. McNeil Co. Inc., 714 W. Olympic Blvd., Los Angeles, **$888,490.** CD 4/6—ENR 4/14.

Idaho, Boise—St. Lukes Hospital, 1 and Bannock Sts., rejected bids Mar. 22, hospital addn., L. B. **$764,321.** Est. $600,000. CD 3/28—ENR 3/31.

La., Shreveport—First Baptist Church, c/o low bidder, Apr. 18, educational bldg., from J. A. Jones Constr. Co., 3600 Southern Ave., **$666,594.** CD 3/29—ENR 3/31.

CONTRACTS AWARDED

●Calif., Los Angeles—Beverly Hills Hotel, 9641 Sunset St., Beverley Hills, 4 story, bsmnt., Beverly Hills Hotel addn., to C. L. Peck Co., 816 W. 5 St., Approx. **$1,000,000.** Paul R. Williams, 3757 Wilshire Blvd., archt.

Conn., Coventry—Southern N. E. Telephone Co., 227 Church St., New Haven, 1 and 2 story brick, steel telephone exchange bldg., dial sys., to Associated Constr. Co., 1010 Wethersfield Ave., Hartford. Approx. **$250,000.** Bids 3/29. CD 3/22—ENR 3/24.

Conn., Hartford—St. Francis Hospital, 114 Woodland St., general contract 5 story, brick, steel, limestone hospital, Ashley and Woodland Sts., to Wadhams & May Co., 15 Lewis St., Hartford, **$733,433.** Bids 3/29. CD 3/15—ENR 3/17.

Fla., Miami—Futuristic Homes, Inc., c/o contractor, 90 homes, to City Construction Corp., 150 N. W. 73 St. Approx. **$500,000.**

Ga., Augusta—Knox Corp., Augusta, 50 homes. Owner builds, **$342,000.**

Ill., Chicago—B'nai Zion Synagogue, 1447 W. Pratt Blvd., 2 story, brick, concrete, stone, steel school and recreation center, to Morris Handler & Co., 2718 Chicago Ave. Approx. **$250,000.** CD 4/2/46—ENR 4/18/46.

Ky., Covington—St. Elizabeth Hospital, c/o contractor, nurses home, to Harry W. Miller Constr. Co., 1511 Neave St., Louisville, **$553,700,** CD 3/25—ENR 4/21, under LB.

Mich., Monroe—Brothers of Holy Cross of Notre Dame, Catholic central high school to Kreighoff-Lenawee Co., Adrian. Approx. **$400,000.** CD 12/5/45—ENR 2/7/46.

●N. J., Atlantic City—Albany Block, Inc., c/o Chelsea Hotel, Atlantic City, apartment, Albany and Atlantic Aves., to Anthony P. Miller, Inc., 3333 Arctic Ave., **$2,000,000.** Edwards & Green, Broadway and Carmen Sts., Camden, archts.

●N. J., Mt. Holly—Clover Hill Garden Apartments, Inc., Wilson Bldg., Camden, apartment development, E. Garden St., to Edwards Building Co., Munn Ave., Haddonfield, **$1,500,000.** Dante D'Anastasio, 2010 Horner Ave., Pennsauken, archt. CD 2/1—ENR 2/10, under CA.

●N. Y., New York—Rockefeller Institute for Medical Research, 66 St. and York Ave., hospital and nurses and doctors residence, 1194-1268 York Ave., to Vermilya-Brown, 100 E. 42 St., Zone 17, Approx. **$2,500,000.** CD 3/21—ENR 4/7.

N. C., Durham—Carolina Terminals, Inc., c/o Sam B. Brockwell, Durham, apartment development. Owner builds. Approx. **$850,000.**

●Pa., Bethlehem—Phillip Ronca, 1303 Delaware Ave., residential development at suburban Fountain Hill, separate contracts. **$1,000,000.**

Pa., Honesdale—Wayne County Memorial Hospital, Honesdale, 3 story, brick hospital, to Tabone & Barbara, Pittston, **$600,000.** Lawrie & Green, 321 N. Front St., Harrisburg, archts. CD 11/29—ENR 12/16.

Pa., Phila.—Hyman Korman, 6033 Castor Ave., residential development, Levick St., separate contracts, **$751,000.**

●Pa., Phila.—Newton Homes, Inc., 115 S. 21 St., residential development, Devereaux St., separate contracts. Approx. **$2,500,000.** J. Ethan Fieldstein, 1325 Walnut St., archt.

●Pa., Pottstown—Stanley Swinehart, 737 Walnut St., residential development, Firestone Dr., separate contracts. **$2,000,000.**

Tex., Austin—East Side Investment Co., c/o Max Brooks, pres., 121 E. 8 St., Commodore Perry Hotel and Office, to Rex D. Kitchens, 608 W. Monroe St., **$903,323.** Bids 3/4. CD 3/8—ENR 3/10, under LB.

Tex., Corpus Christi—Buccaneer Gardens, c/o Fisher & Joe J. Alsup, Wilson Bldg., 128 units, brick veneer apartment, concrete slab fdn., in Buccaneer Gardens, to Adams & Baker Constr. Co., c/o owner. Approx. **$750,000.** Don Schuyler, Tuscaloosa, Ala., archt. CD 3/11—ENR 3/24.

●Tex., Corpus Christi—Buccaneer Gardens, c/o Fisher & Joe J. Alsup, Wilson Bldg., 214 two bedroom brick apartment units, concrete slab fdn., Buccaneer Gardens area, to Adams & Baker Constr. Co., c/o owner. Approx. **$1,700,000.** Don Schuyler, Tuscaloosa, Ala., archt.

Tex., Corpus Christi—Corpus Christi, Inc., c/o Airport Rd., 101 single bedroom housing units, between Almeda and Staples Sts., to Lee Aikin Co., c/o Airport Rd., **$460,000.** CD 3/3—ENR 3/17.

Tex., Corpus Christi—Corpus Christie, Inc., Airport Rd., 101 double bedroom housing units, to Lee Aikin Co., Airport Rd. Approx. **$560,000.** CD 3/3—ENR 3/17.

●Tex., Houston—West Ridge Homes, Inc. 4815 Richmond Rd., 165 dwellings off Longpoint Rd. between Spring Branch and Hempstead Hy., to M. E. Glosson, 4815 Richmond Rd. Approx. **$1,250,000.** CD 4/8.

Tex., Kilgore—Home Builders, Kilgore, housing. Owner builds. **$250,000.** CD 4/1—ENR 4/21.

Tex., Wichita Falls — E. E. Cloer, 2825 Crockett St., Fort Worth, 16 apartments of 100 units. Owner builds. Approx. **$700,000.** CD 3/17—ENR 3/31.

Tex., San Antonio—C. L. Browning, Jr., Insurance Bldg., 175 dwellings, off Salado Creek. Owner builds. Approx. **$800,000.** CD 4/14.

Tex., San Antonio—E. J. Burke & Sons, 4220 S. Zarzamora St., 80 units on single-family houses and duplexes, off New Braunfels Ave., purchase and hire. Approx. **$500,000.** CD 4/11—ENR 4/21.

Va., Norfolk—H. C. Hofheimer, II, 2125 Kimball Terrace, 204 unit Negro Housing development, to Ibec Housing Corp., 30 Rockefeller Plaza, New York, N. Y. T. David FitzGibbon Royster Bldg., archt.

●**W. Va., Charleston**—F. W. Woolworth Co., c/o contractor, department store, to H. B. Agsten & Son, Morrison Bldg. Approx. **$1,000,000.** CD 4/14.

INDUSTRIAL BUILDINGS

BIDS ASKED

Minn., Sleepy Eye—WAREHOUSE, etc.—Brown Co. Rural Electric Assn., H. A. Rosseth, mgr., 1 story, 102x120 ft. warehouse and office, $100,000. Dreher & Ross, Mankato, archts. CD 8/12—ENR 8/26.

Tex., Houston — PLANT — Dalton Burns & Assoc., 2911 Tangley St., steel drum reconditioning plant. $110,000. CD 4/18.

SOON LETS CONTRACT

Ariz., Phoenix — TERMINAL — Greyhound Bus Lines, Pine and Battery Sts., San Francisco, Calif., soon lets contract bus terminal, $750,000. H. H. Green, Security Bldg., archt. CD 12/30—ENR 1/20.

Ill., Chicago — SHOWROOM — Packard Motor Co., 2420 S. Michigan St., soon lets contract 2 story, brick, concrete, steel, stone showroom, $300,000. Albert Kahn Assoc. Architects & Engineers, Inc., New Center Bldg., Detroit, Mich., archt.

Minn., St. Paul — PLANT — DeLuxe Check Printers, Inc., 2531 University Ave., soon lets contract 1 story, 182x228 ft. factory, Wheller St. and University Ave. $100,000. Slifer & Cone, 441 Endicott Bldg., St. Paul, archts.

●**N. M., Lovington** — POWER PLANT — Lea County Electric Co-operative, Inc., Robert Moore, mgr., Lovington, soon lets contract 2 story power plant, incl. two 1200 kw. generators, diesel powered. $1,250,000. Continental Engineers, 1310 Avenue Q, Lubbock, Tex., engrs. and archts. CD 4/18.

Tex., Dallas — WAREHOUSE, etc. — Lone Star Gas Co., 1915 Wood St., soon lets contract 1 and 2 story, 38,000 sq. ft. masonry warehouse, office, storage and repair garage, heating units. $445,945. Grayson Gill, 1913 San Jacinto St., archt. CD 1/27—ENR 2/17.

●**Tex., Houston** — PLANT, etc. — National Steel Co., 1901 Franklin St., soon lets contract 14 plant bldgs., steel frame, corrugated metal siding and roof, concrete slab fdn. constr., air-conditioning, $750,000; 450x462 ft. brick wall, stone trim, warehouse, concrete slab fdn. and frame, $500,000 C. J. Kelin, 1303 Austin St., engr. and Engineering Dpt. of Weirton Steel Co., Weirton, W. Va., engr. CD 3/22—ENR 3/31.

LOW BIDDERS

La., New Orleans—SALES and SERVICE—Woodward, Wight & Co., 451 Howard Ave., Apr. 12, sales and service bldg. alterations, addns. from J. Gordon Lee, Carondelet Bldg., **$79,345.** CD 3/30—ENR 4/7.

Tex., Irving—GAS TERMINAL—Humble Oil & Refining Co., Sales Dpt., 3010 McKinney St., Houston, rejected bids 1 story, structural steel frame, etc. gas terminal addn. **$200,000.** Project abandoned. CD 4/5—ENR 4/14.

Tex., San Antonio—ADMINISTRATION—San Antonio Transit Co., Transit Tower Bldg., rejected bids Mar. 25, administration bldg. **$400,000.** Project indefinitely postponed. CD 3/11—ENR 3/17.

Tex., San Antonio—SERVICE STATIONS—Sinclair Refining Co., c/o B. D. Dixon, 1305 S. Laredo St., rejected bids master type service station, Nogalitos, Rosslyn, S. Presa, Hampshire Sts. **$75,000.** CD 3/30—ENR 4/7; masonry, steel, concrete super service station, W. Commerce and Zarzamora Sts., **$75,000.** CD 3/24—ENR 3/31.

CONTRACTS AWARDED

Calif., San Francisco—GARAGE—Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y., 2 story, concrete garage on N.

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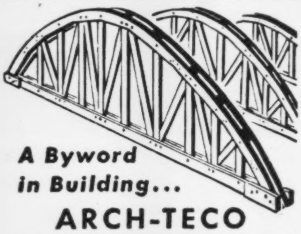

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Junipero Serra Blvd. at 19 Ave., to Starrett Bros. & Eken, Inc., 63 Wall St., New York, N. Y., Approx. **$528,000.** Harry A. Thomsen & Aleck L. Wilson, 315 Montgomery St., San Francisco, archts.

●**Calif., San Francisco**—GAS HOLDER—Pacific Gas & Electric Co., 245 Market St., 17,000,000 cu. ft. gas holder, N. 23 St. and Pennsylvania St. Owner builds. **$2,191,375.** CD 2/28—ENR 3/10.

●**Calif., San Leandro**—PLANT, etc.—General Foods Corp., 775 Terminal, Los Angeles, 3 story main food processing mfg. plant and 1 story warehouse, to Swinerton & Walberg, 225 Bush St., San Francisco, Approx. **$1,000,000.** H. J. Brunner, 612 Sharon Blvd., San Francisco, engr. CD 6/4/48—ENR 6/17/48.

●**Calif., Torrance**—PLANT—Pittsburgh Plate Glass Co., 7412 Maie Ave., Los Angeles, Mar. 23, general contract 1, 2 and part 3 story, steel, concrete mfg. plant, warehouse, and office, from MacIsaac & Meuke, 3440 E. 22 St., Los Angeles, **$862,476.** CD 3/8—ENR 3/10.

●**Colo., Denver**—WAREHOUSE, etc.—Western Electric Co., Inc., Stanley Braken, pres., 195 Broadway, New York, N. Y., general contract 1 story, 350x400 ft. warehouse and office, to Swinerton & Walberg, 3223 East 46 Ave., Approx. **$2,000,000.** Bids 3/21, awarded 4/16. CD 3/18—ENR 3/24.

●**Miss., Yazoo City** — PLANT — Mississippi Chemical Corp., c/o contractor, anhydrous ammonia plant, to The Girdler Corp., 224 E. Broadway, Louisville, Ky., Approx. **$1,000,000.**

UNCLASSIFIED

BIDS ASKED

May 5

New York—BATHING DEVELOPMENT—Palisades Interstate Park Comn., Bear Mountain, construct Sebago Bathing Development, incl. 200,000 gal. reservoir, water and sewer pumping houses with equip. and appurtenances in Harriman State Park, Orange and Rockland Counties. Plans deposit $10.

About May 11

†**N. M., Albuquerque** — STEAM HEATING PLANT — U. S. Eng., P. O. Box 1538, steam heating plant addn, Sandia Base, Serial No. 291-49-79.

June 8

●**Wash., Seattle**—GENERATORS—City, County-City Bldg., Zone 4, three 100,000 kva. generators for Ross Dam power plant. $3,000,000. E. R. Hoffman, city light supt.

Bids Asked

Okla., Elk City—LOADING RACKS, etc.—Shell Pipe Line Corp., Mayo Bldg., Tulsa, loading racks, gathering lines in Elk City fields, 5 mi. delivery line, pumping unit. $100,000.

SOON LETS CONTRACT

Kan., Leavenworth — DRIVE-IN-THEATRE—Durwood Theaters, c/o Truman Schlup, engr., 1401 Fairfax Trafficway, Kansas City, soon lets contract drive-in theatre. $150,000. CD 4/6—ENR 4/21.

Kentucky—RURAL DISTRIBUTION LINES—Fleming-Mason Rural Electric Corp., Fleming, soon lets contract 61.3 mi. rural distr. lines, Fleming, Lewis, Greenup and Carter Counties, Patterson & De War, Rutland Bldg., Decatur, Ga., engrs. CD 6/5/47—ENR 6/26/47.

LOW BIDDERS

●**Calif., San Francisco**—FIELD HOUSES, etc.—Recreation Comn., City and San Francisco Co., City Hall, Apr. 12, constr. 4 two story rein.-con. field houses and wood frame gymnasium bldgs. at Potrero Hill Playground St. Mary's Playground, Oceanview Playground and Sunset Playground, from M & K Corp., 405 Montgomery St., **$1,359,873.** CD 3/20.

Iowa — RURAL DISTRIBUTION LINES — Central Iowa Power Co-operative, Cedar Rapids, rural distr. lines, etc. Proj. Iowa 83GT, Cedar Rapids, Sect. 3, from Trans-Electric Builders, Inc., 1901 Easton Blvd., Des Moines, **$307,567;** Sect. 4, from Hoak Constr. Co., 631 63 St., Des Moines, Zone 12, **$300,566.** Combination Sects. 3 and 4. **$615,410.** CD 2/16—ENR 2/24.

†**Oregon**—RAILROAD RELOCATION—U. S. Eng., Pittock Block, Portland, Zone 5, Apr. 12, sect. Southern Pacific R. R. relocation and sect. Oregon State Hy. 58 relocation in vicinity of Lookout Point Dam, Lane Co. Eng-35-026-49-435, from Kenneth L. Goulter & Co., Dexter. **$983,620.** Est. $1,032,817. CD 1/19—ENR 1/27.

●**Pa., Phila.**—PIER—Dpt. Wharves Docks & Ferries, Pier 4, S. Chestnut St., Apr. 21, Pier 80 south superstructure, from Hughes-Foulkrod Co., 1505 Race St., **$2,524,087.** CD 4/13.

CONTRACTS AWARDED

●**Ohio**—PIPELINE—Ohio Fuel Gas Co., 99 N. Front St., Columbus, replacing 84 mi. pipeline, 38 mi. from Crawford compressor station in Route 33 at Sugar Grove to Columbus; replace pipeline from Columbus to Treat compressor station near Utica; 1½ mi. new pipe from Mt. Gilead to 5 mi. north of Galion, 20 in. high pressure pipe, own forces. **$4,167,009.** CD 6/18—ENR 7/8.

●**Ontario** — RAILROAD — Northern Alberta Railways Co., H. W. Tye, eng., Maintenance Ways and Structures, Edmonton, Alta., 35 mi. railroad, Rycroft-McLennan, reballasting 30 mi. main line, ditching along track, station enlargements. Owner builds. **$1,000,000.**

CONSTRUCTION REPORTS—Third Section

WATER SUPPLY

BIDS ASKED

May 3

Conn., Glastonbury—Harman Roser & Sons, Inc., New London Turnpike, water treatment plant, filtering facilities, etc. $28,000. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs.

May 10

Wis., Sturgeon Bay—Sturgeon Bay Utilities Co., Sturgeon Bay, **(1)** 250,000 gal. steel elevated storage tank **(2)** 350,000 gal. steel ground storage tank; **(3) alternate, 350,000** gal. concrete ground storage reservoir **(4)** combined bids for 1 and 2. McMahon Eng. Co., Menasha, engr.

LOW BIDDERS

Fla., Miami Beach—City, booster pumping station Contr. 49-2, from Paul Smith Constr. Co., 3103 N. W. 20 St., Miami, **$28,281.** CD 2/26/47—ENR 3/20/47.

La., Harvey—Second **Jefferson Drainage** Dist., Marrero, Apr. 18, pumping plant extens., Harvey Canal, from Mechanical Epuip Co., 861 Carondelet St., New Orleans, **$98,029.** CD 3/16—ENR 3/24.

Tex., Beaumont—City, Apr. 19, 1 m.g. elevated steel tank, from Pittsburgh-Des Moines Steel Co., Praetorian Bldg., Dallas, **$132,500.** Est. $100,000. CD 3/25—ENR 3/31.

Wis., Milwaukee—City, City Hall, 200 E. Wells St., watermain in N. Booth St., from Werner Co., 9511 W. Harding Blvd., Wauwatosa, Zone 13, **$75,495.** J. P. Schwada, city engr.

CONTRACTS AWARDED

Ia., Ottumwa—City, City Hall, WW sys. imprvs., piping, to American Cast Iron Pipe Co., Ottumwa, **$97,796.** Bids 4/15. CD 3/23 —ENR 3/31.

O., Wooster—City, excavate, backfill and install 11,210 ft. 16 in. water pipe, to H. Heise, Wooster, **$37,559.** Jones, Henry & Schoonmaker, Security Bldg., Toledo, engrs. CD 3/16/44—ENR 4/6/44.

Tex., Carthage—City, drilling, casing, developing water supply well, to Texas Water Wells, Inc., 951 Mc Carty St., Houston, **$31,000.** Bids 4/18. CD 4/11.

Tex., Kenedy—City, c.i. 6 in. waterlines, Purchase and Hire, **$30,000.**

†Puerto Rico, Fort Brooke and Fort Buchanan—U. S. Eng., Box 5043, Ancon, Canal Zone, 1 m. gal. water storage facilities, Serial No. Eng-96-505-49-113, to Caribbean Enterprises Corp., Garcia Commercial Bldg., Labra Avenue-Stop 18, Santurce, Puerto Rico, **$184,145.** CD 2/25.

SEWERS, WASTE DISPOSAL

BIDS ASKED

May 9

Tex., Merkel—City, A. J. Canon, mayor, 10 in. pipe outfall sewer line, manholes, etc. $50,000. French Eng. Co., 9 and 10 Radford Bldg., Abilene, engr. CD 5/18/48—ENR 5/27/48.

May 10

Conn., Storrs—State, Raymond S. Thatcher, comptroller, State Capitol, Hartford, sewage disposal plant, treatment facilities, University of Connecticut. Plans deposit $50.

LOW BIDDERS

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, Apr. 19, 6.9 mi. 8 and 10 in. vitr. clay sanitary sewers, San Dimas Ave., etc., San Dimas, from Max Melosvitch, 733 Bernard St., **$153,754,** est. $147,000; 3.62 mi. 6 and 8 in. vitr. clay sanitary sewers in Norwood Pl., Wilmar, from A. R. Mislosovitch, 303 N. Alma St., Long Beach, **$74,240,** est. $77,750. CD 4/7.

Conn., Bristol—City, R. E. Rowe, clk., City Hall, Apr. 19, Contr. 6, 15,000 ft. 8- to 24-in. and sewers and 2,400 ft. 10 c.i. force main, from New Haven Constr. Co., Inc., 37 Colony St., Hamden, **$224,637.** CD 3/15—ENR 3/17.

●Ill., Chicago—Sanitary Dist. of Chicago, 910 S. Michigan St., Apr. 21, furnishing, installing 66 vacuum type sludge filters, 4 vacuum receivers and other equip., Div. N., from General American Transportation Corp., 135 S. La Salle St., **$1,062,157;** furnishing, installing insulation and linings Div. V, from Asbestos & Magnesia Materials Co., 123 N. Peoria St., **$376,759,** both for West-Southwest Sewage Treatment Wks., Stickney.

Ill., Zion—State National Guard, State Armory Bldg., Springfield, sewage treatment plant, from Robert A. Black, Inc., 5 E. Erie St., Chicago, **$74,800.** C. Herrick Hammond, State Armory, Springfield, state archt.

Md., Baltimore—Mayor & City Council, City Hall, Apr. 20, 25x55x60 ft., brick, concrete sewage pumping station, 100 lin. ft. 24- and 30-in. vitr. pipe and masonry sewers, 300 lin. ft. 24- to 36-in. c.i. pipelines, etc., Brooklyn Sewage Pumping Station, Sanitary Constr. 339, from Chesapeake Contractors, Inc., 10 W. 25 St., **$281,529.** CD 4/7—ENR 4/14.

†Mo., Liberty—U. S. Eng., 601 Davidson Bldg., Kansas City, Apr. 20, 15,400 ft. concrete outfall sewer, manholes, along Missouri River, 5.5 mi. south of here, from Bennett Constr. Co., 1520 Central St., Kansas City, Mo., **$197,891.** CD 3/23—ENR 3/31.

Mo., Mt. Vernon—City, c/o Homer Goodman, clk., Mt. Vernon, sewage collecting sys., incl. 29,000 ft. 6- to 10-in. vitr. clay pipe, with trench work, 19 lampholes, 45 cu. yd. rein.-con. in lift stations, from Freer Constr. Co., 1501 Kentucky St., Joplin, **$92,106.** CD 2/21—ENR 2/24, under LB.

N. C., Dunn—Town, Town Hall, Apr. 15, Contr. 1, sewer plant, from O. W. Godwin, Dunn, **$61,983*****Contr. 2, sewer lines, from T. A. Loving & Co., Goldsboro, **$173,414***** Contr. 3, waterlines, from Jenkins Bros., Horne St., Raleigh, **$123,919.** CD 3/24—ENR 3/31.

Tex., Austin—City, sanitary sewers adjacent to Waller Creek, 7 to 26 Sts., force account, **$215,000.** Bids 4/12 rejected, L.B. $248,581. CD 4/20—ENR 4/28, under LB.

Tex., Beaumont—City, City Hall, Apr. 19, storm sewers, concrete box and pipe types, in High School area, from Tellepsen Constr. Co., 1710 Telephone Rd., Houston, **$77,376.** Est. $60,000. CD 4/11.

Tex., Dallas—City, Apr. 19, Bachman Creek sanitary sewers, from Cole Williams, Inc., Route 7 Box 427A and W. G. Cullum & Co., Great Natl. Life Bldg., **$42,340.** CD 12/1—ENR 12/23.

CONTRACTS AWARDED

Pa., Willow Grove—Upper Moreland Twp. Comn., Willow Grove, sanitary sewers Evans Ave., etc., to Carbone Bros., 4820 Roosevelt Blvd., Phila., Zone 31, **$90,608.** Est. $100,000. Bids 4/11, awarded 4/16. CD 3/30.

Tex., Kenedy—City, approx. 14,000 lin. ft. sanitary sewer collection lines, appurtenances, Purchase and Hire, **$55,000.** CD 10/22/47—ENR 11/13/47.

Ont., Leaside—Municipality, storm sewers, to Ruscica Bros., Co. Ltd., 41 Industrial St., Approx. **$50,000.** Bids 4/18.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

May 6
Illinois
Kansas
Pennsylvania
Washington
May 11
California

May 17
Florida
May 18
California
May 19
California

May 16

Calif., Danville—Contra Costa Co., Hall of Records, Martinez, rein.-con. structural steel bridge on steel piling. Approx. $50,000. Plans deposit $25. Jos. W. Barkley, Hall of Records, Martinez, engr.

On or About May 24

†Georgia—U. S. Eng., P. O. Box 1169, Mobile, Ala., bridge over Little River at Cherokee Mills., Cherokee Co., Serial No. Eng.-01-076-49-145.

May 24

†Louisiana—U S. Eng., foot of Prytania St., New Orleans, 195 ft. treated timber bridge over Bayous Rapides, Boeuf and Cocodrie Diversion Channel, So. 13 plus 85 (Mile 44.80) Reach 5, 2 mi. west Lamourie, Rapides Parish, Serial No. Eng.-16-047-49-277; 3 foot bridges, 1 road bridge over Bayous Rapides, Boeuf and Cocodrie Diversion Channel, Reach No. 5, between Stations 676 plus 70 and Sta. 5 plus 25, approx. 2 mi. west of Lecompte, Rapides Parish, Serial No. Eng.-16-047-49-276.

LOW BIDDERS

†California—U. S. Eng., Wright Bldg., Sacramento, Apr. 19, bridge and weir near Piedra, Spec. 1341, from Granite Constr. Co., Box 900, Watsonville. **$128,246.**

Pennsylvania—State Hy. Dpt., Harrisburg, Apr. 22, construct plate girder railroad overpass bridge and rein.-con. paving to eliminate 2 grade crossings, U. S. 11 and T.R 14, Northumberland Co., from The Marshall Co., 1506 Mayflower St., Harrisburg, **$76,645;** removing Penrose Ferry Road Bridge, City of Philadelphia, Philadelphia Co., from Lipsett, Inc., 80 Wall St., New York 5, N. Y., **$178,900.** CD 3/30—ENR 4/7.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

May 2
Nova Scotia
May 3
Maryland
May 4
Louisiana
New York
Pennsylvania

May 5
Kansas
Nebraska
May 6
Illinois
Kansas
Minnesota

Washington
May 10
Kansas
Michigan
May 11
California

May 17
Florida
May 18
Delaware
May 19
California

May 6

Calif., Sacramento—City, City Hall, imprv. streets in Gagemont Tract Res. 2741. Approx. $50,000. Plans deposit $10. Fred Klaus, City Hall, engr. CD 11/12/45—ENR 11/29/45.

May 10

O., Toledo—Bd. Comrs., Lucas Co. Adelaide E. Schmitt, clk., Courthouse, grading, berms and installing drainage in Driftmeyer Ditch 164 along Lallendorf Rd. from Starr Ave. approx 1½ mi. north in Oreton Twp. Rd. Imprvt. 584. $150,000. Melvin Rice, co. engr. CD 1/4.

May 11

La., Gretna—Jefferson Parish Police Jury, Gretna, c. conc. driveways, etc., Ave. A., Betz Pl., Beverly Gate, alternate, on asph. paving, Beverly Dr., Mitarie Lawn Dr. Plans deposit $20. S. N. Applewhite, 424 Millandon St., engr.

About May 26

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, roads and steam distr. EOP 921D, Sandia Base, Serial No. Eng-29-005-49-88.

LOW BIDDERS

Colorado—State Hy. Dpt., Denver, Apr. 19, grading, surf., structures, 1.039 mi. State Hy. 340 from point near intersection of Rood Ave. and West St. inside Grand Junction and exten. southwest, from Gardner Constr. Co., Glenwood Springs, **$404,934.** Est. $461,581. CD 4/4—ENR 4/7.

●Louisiana—State Hy. Dpt., Baton Rouge, Apr. 20, from Henry & Hall, Dubach, soil cement base course, alternate sand clay grav. base course and bit. surf. 5.438 mi. Sterlington-Haile Hy., State Rt. 11, S. P. 155-01-03, F. A. S. P. S-48, Union Co., **$164,870,** CD 4/1—ENR 4/7*** from T. L. James & Co. Inc., Ruston, sand clay grav. or soil cement base and bit. 4.256 mi. Many-Pleasant Hill Hy., State Rts. 1 and 51, S P. 35-01-05 and 35-02-07, F. A. S. P. F-144 (1), and S-101 (1), Sabine Parish, **$203,375,** CD 3/28—ENR 3/31; c. conc. 0.987 mi. West Park Ave. and Main St. (Houma) State Rts. 965 and 69, S. P. 855-06-02 and 65-04-05, **$57,610;** c. conc. 6.13 mi. Presque Isle-Montegut Houma-Ashland and Houma Chauvin Hys., State Rts. 69-81 and 141 and 79, S. P. 65-03-13, 248-02-06 and 246-03-03 and 247-03-03, F. A. S. P. S-381 (1) S-120 (1), S 121 (1), **$451,415*****from Forcum James Co., 1565 Choctaw Dr., Baton Rouge, c. conc. 4.314 mi. Houma-Central and Houma Theriot Hys., State Rts 79 and 247, S. P. 412-01-06 and 245-03-22, F. A. S. P. S-118 (1), and S-119 (1), **$277,305,** all foregoing Terrebonne Parish, CD 3/25—ENR 3/31.

Maine—State Hy. Dpt., Augusta, Apr. 20, bit. mac. 2.004 mi. F. A. Proj. 84 (15), Searsport, from The Bridge Constr. Corp., 284 Water St., Augusta, **$259,416;** 4.25 mi. F. A. Proj. F 116 (11) D. Woolwich and Wiscasset, from W. H. Hinman, Inc., North Anson, **$368,101,** both Waldo Co. CD 4/11—ENR 4/14.

Md., Baltimore—Mayor & City Council, City Hall, rejected bids Apr. 13, c. conc. paving streets, Hy. Contr. 957, L. B. **$74,026.** CD 4/19 —ENR 4/21, under LB.

Mo., Kansas City—City, c/o Reed McKinley, dir. P. Wks., City Hall, asph. resurf. streets, Dist. 1, from Bowen Constr. Co., 3200 Fairmont St., **$165,435;** Dists. 2 and 3, from Midwest Pre-Cote Co., 7600 E. 17 St., **$183,888** and **$139,430** respectively. CD 5/25/43—ENR 5/27/43.

●Pennsylvania — State Hy. Dpt., Harrisburg, Apr. 22, wid'n; macad. or vitr. brick surf. 1.11 mi. U. S. Routes 22 and 30, Allegheny Co., from DiNardo, Inc., 311 Bouquet St., Pittsburgh, **$393,871*****wid'n, macad. surf. 5.79 mi., construct I-beam bridge and extens. to 3 rein.-con. bridges, U. S. 611, from near Harrow to north of Kintersville, Bucks Co., from Keelor Constr. Co., Perkiomenville, **$726,907*****wid'n. 8.23 mi., exten. 7 rein.-con. structures, construct 1 rein.-con. bridge, T.R. 14, Bradford Co., from Highway Paving Co., Phila., **$578,904*****wid'n., macad. surf. 1.04 mi. and construct I-beam bridge, Rural Route 20030, Crawford Co., from W. L. Dunn Constr. Co., Cochranton, **$97,279*****wid'n.; 1.14 mi. U. S. 119 from Point Marion Boro south in Springhill Twp., Fayette Co., from C. S. Yoder, Uniontown, **$73,811*****wid'n., macad. surf. 2.37 mi. T.R. 56 and 711, from Armagh Boro, south in East Wheatfield Twp., Indiana Co., from L. R. Owen Co., R. D. 2, Johnstown, **$142,979*****wid'n., macad. surf. 4.88 mi. T.R. 115, between Stoddartsville and Shades Glen through Bear Creek, Luzerne and Monroe Counties, and wid'n, macad. surf. 1.74 mi. U. S. 309, West Pittston, Luzerne Co., from G. B. Constr. Co., Inc., Lebanon, **$187,614** and **$69,165** respectively***wid'n., macad. surf. 5.35 mi., incl. constructing 1 rein.-con. bridge and wid'n. 3 concrete structures, U. S. 62, from Sandy Lake Boro east through Sandy Lake and Mineral Twps., Stoneboro, Mercer and Venango Counties, from Kelley & Meyer Co., Dollar Bank Bldg., Youngstown, O., **$291,769*****wid'n., macad. surf. 5.78 mi., construct I-beam bridge, T. R. 115, Northampton Co., from Kingston Contg. Co., Shenandoah, **$498,462*****wid'n., macad. surf. 4.06 mi., construct rein.-con. bridge eliminating grade crossing, U. S. 219, Somerset Co., from Nichols Constr. Co., Brookville, **$770,340*****grav. surf. 5.5 mi. Rural Rt. 61031, Warren Co., from George H. Yoxtheimer, Northumberland, **$71,637*****wid'n., macad. surf. 4.26 mi. Rural Rt. 62180, construct. rein.-con. bridge, wid'n. another, Washington Co., from Rothey Bros., Inc., Elizabeth, **$350,538.** CD 3/30—ENR 4/7.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, 5.8 mi. plant mix on cement treat surf., constr. concrete slab bridge over Spring Creek and 2 small bridges over A. C.I.D. Canal between Anderson and Clear Creek, Shasta Co., to Frederickson & Watson Constr. Co., 873 81 Ave., Oakland **$742,432.** Bids 3/30, awarded 4/20. CD 4/5—ENR 4/7, under LB.

California—State Div. Hys., State Bldg., Los Angeles, plant mix surf. 6.7 mi., constr. rein.-con. slab bridge on Ridge Route between 0.3 mi. north of Los Alamos Creek and 2.3 mi. south of junction with State Rt. 50, Los Angeles Co., to Peter Kiewit Sons Co., 345 Kilway Ave., Arcadia, **$874,114.** Bids 4/7. CD 4/14—ENR 4/21, under LB.

Calif., Los Gatos—City, 110 E. Main St., imprv. streets, to Leo Piazza, 175 S. Montgomery St., San Jose, **$147,940.** CD 3/12/46—ENR 4/4/46.

Ga., Atlanta—City, c/o L. A. Walker, purch. agt., City Hall, resurf. various streets, Sect. 1, to MacDougald-Warren Co., Northside Dr. N. W., **$53,869;** Sect. 2, to McIntosh Paving Co., 365 Luckie St. N. W., **$53,489.** Bids 4/18.

†Ga., Ft. Benning—Purchasing & Contracting Office, Ft. Benning, various curb and gutter, and paving, to Wright Contg. Co., 504 25 Ave., Columbus, **$50,444.**

Ill., Chicago—City, City Hall, paving N. Damen Ave., from W. Lawrence Ave. to W. Balmoral St., to W. J. Sheppard Co., 1412 W. Altgeld St., Approx. **$223,953.** Bids 2/25, awarded 4/4.

Maine—State Hy. Dpt., Augusta, b. conc. 6 mi. Proj. 437-I, Benton and Clinton, to Warren Bros. Roads Co., 38 Charles River Rd., Cambridge, Mass., **$57,018;** 5 mi. Proj. 438-I, Hermon, to Lane Constr. Corp., Meriden Conn., **$65,463,** both Kennebec Co. CD 4/11—ENR 4/14.

Miss., Quitman—Town, Town Hall, street paving, to Jerry G. Alexander & Co., Hattiesburg, **$115,774.** Bids 4/19. CD 4/8.

Tex., Karnes City—Karnes Co., Courthouse, farm-to-market road constr., Precinct 1, **$90,000;** Precinct 6, **$75,000,** force account. C. C. Klumpp; Kenedy, engr.

EARTHWORK, WATERWAYS

BIDS ASKED

May 3

●†North Dakota—U. S. Eng., Fort Lincoln, Box 300, Bismarck, hydraulic turbines, Garrison Dam, Missouri River. $2,000,000-$4,000,000. CD 6/1/44—ENR 6/15/44.

About May 8

†Missouri—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, Zone 1, imprv. levees, Elsberry Drainage Dist., Pike and Lincoln Counties, involv. 31,000 cu. yd. levee embankment, in vicinity Elsberry.

About May 9

†Illinois—U. S. Eng., 826 U. S. Court House and Custom House, 1114 Market St., St. Louis 1, Mo., clearing, snagging McKee Creek, Miles 3.6 to 8.0 on south fork and Miles 0.0 to 4.2 on middle fork, vicinity Chambersburg and Perry, Pike Co.

May 10

†Louisiana—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, 500,000 cu. yd. earthwork, Red River below Dension Dam, Item R 140.8-L, Aloha-Rigolette Levee, 2nd lift enlargement, Type 2 (semi-compacted) fill, Sta. 815 plus, Sta. 1073 plus 18.27, 19 Louisiana Levee and Drainage Dist., Grant Parish and Red River, Bayou Darrow and Bayou Rigolette Levee Dist., Rapides Parish, Serial No. Eng.-16-047-49-285; 850,000 cu. yd. semi-compacted fill, Type 2, Red River below Dension Dam, Aloha-Rigolette Area, Item R 135.0-132.1-L, Aloha-Rigolette Levee, Sta. 1073 plus 18.27, Sta. 1097 plus 09, 1094 plus 63.69 c.s. and 1245 plus 66.64, Red River, Bayou Darrow and Bayou Rigolette Levee Dist., Rapides Parish, Serial No. Eng.-16-047-49-286; 400,000 cu. yd. Type 2, semi-compacted fill, Red River below Denison Dam, Item R 150.0-140.9-L, Aloha-Rigolette Levee, Sta. 1051 plus 04, Sta. 1334 plus 62 equal Sta. 810 plus 70.27 c.s. 19, Louisiana Levee and Drainage Dist., Grant Parish, Aloha-Rigolette Area, Serial No. Eng.-16-047-49-284.

About June 1

†Iowa—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., first stage Coralville Dam, Coralville Reservoir, Iowa River, near Iowa City, involv. clearing, grubbing, east and west access roads, grading, surf. field office, deep well, water supply sys., earthwork, incl. stripping borrow pits, placement, portion permanent embankment, excavation cut-off trench and outlet structure, stone embankment protection.

June 1

●†Washington—U. S. Eng., Walla Walla, 1st step cofferdam and excavation within cofferdam, Ice Harbor Dam. $2,000,000-$3,000,000.

June 7

†California—Bureau Reclamation, Dpt. Interior, Tracy, earthwork, concrete lining, structures for Delta-Mendota canal, Station 2149 plus 80 to 3024 plus 80, about 4 mi. west of Newman, and exten. in southerly direction, Central Valley Proj., Spec. 2649. L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr.

June 28

●†Washington—U. S. Eng., Walla Walla, levees, Richland. $2,000,000-$3,000,000.

LOW BIDDERS

†California—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 55, Apr. 15, North Jetty and San Diego River and Mission Bay Proj., incl. approx. 3,300 ft. stone jetty, clearing and removing obstruction, excav., Serial No. Eng.-04-353-49-58, from Clyde W. Wood, Inc., P. O. Box 620, North Hollywood. **$893,850.** CD 3/21—ENR 3/24.

†California—U. S. Eng., Wright Bldg., Sacramento, Apr. 19, calyx core drilling at Pine Flat Dam near Piedra, and Folsom Dam near Folsom, Serial No. Eng.-04-167-49-84, from George F. Casey Co., 1373 2 St., Berkeley. **$49,300.** CD 4/7.

†Ia., Council Bluffs—U. S. Eng., 1709 Jackson St., Omaha, Neb., Apr. 21, agricultural levees, Serial No. Eng.-25-066-49-192, Sect. 1, from Clausen, Olsen & Benner, Holdrege, Neb., **$272,389;** Sect. 2, from Ace Constr. Co., 2110 S. 55 St., Omaha, Neb. **$407,103.** CD 4/13.

†Kansas—U. S. Eng., Davidson Bldg., Kansas Bldg., Kansas City, Apr. 12, raising stockyard bridge, Serial No. Eng.-23-028-49-174, from Eichleay Corp., 33 S. 19 St., Pittsburgh, Pa. **$85,898.** CD 3/16—ENR 3/24.

†Louisiana—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, Mar. 30, casting 48,000 squares articulated concrete mattress with 48,000 bbl. cement at Govt. Casting Field, Vidalia, Serial No. Eng.-16-047-49-244, from Warren Bros. Roads Co., First National Bldg., Birmingham, Ala. **$484,800.** CD 3/21—ENR 3/24.

†Michigan—U. S. Eng., 428 Federal Bldg., Milwaukee, Zone 1, Wis., Apr. 20, dredging, pier and revetment, Manistee Harbor, Serial No. Eng.-47-013-49-56, from Love Constr. & Engr. Co., 740 N. Western Ave., Muskegon. **$140,742.** Est. $147,318. CD 3/24—ENR 3/31.

†Virginia—U. S. Eng., foot of Front St., Norfolk, Zone 1, Apr. 12, dredging approx. 230,000 cu. yd. material, Elizabeth River, Eastern Branch, Norfolk Harbor, Eng.-44-110-49-27, from Norfolk Dredging Co., Compostella Wharf, Norfolk. **$174,344.** Est. $168,945. CD 3/14—ENR 3/17.

CONTRACTS AWARDED

†Maryland—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash. 25, D. C., dredging Town Creek and Black Walnut Harbor, Talbot Co., Serial No. Eng.-18-020-49-58, to Steen Contg. Corp., 541 Front St., Norfolk, Zone 7, Va. **$56,411.**

●†Montana—Bureau Reclamation, Dpt. Interior, Helena, Canyon Ferry Dam and power plant, 16 mi. northeast Helena, Missouri River Basin Proj., Spec. 2585, to Canyon Constructors (Brown & Root, Inc., P. O. Box 1139, Austin, Tex., Wunderlich Contg. Co., 530 Desnoyer Ave., St. Paul, Minn., Griffith Co., 1060 S. Broadway, Los Angeles, Calif., and J. C. Maguire, 816 W. 5 St., Los Angeles, Calif), Los Angeles, Calif. **$11,896,425.** Bids 4/6, awarded 4/20. CD 4/12—ENR 4/14, under LB.

†Oklahoma—U. S. Eng., Box 61, Tulsa, 2 hydraulic turbines for Tenkiller Dam on Illinois River, Spec. 34-066-49-67, to S. Morgan Smith Co., York, Pa. **$580,911.** Bids 3/1, awarded 4/5. CD 1/28—ENR 2/3.

AIRPORTS AND AIRBASES

BIDS ASKED

Tex., Grand Prairie — HANGAR — Chance-Vought Aircraft, c/o Earl Martin, Grand Prairie, hangar. $100,000. Albert M. Kahn & Assoc., 345 New Center Bldg., Detroit, Mich., engr. and archts. CD 3/24—ENR 4/14.

LOW BIDDERS

†Ill., Springfield—AIRPORT FACILITIES—U. S. Eng., 520 Merchandise Mart, Chicago, Zone 54, Apr. 19, paving for hangar, etc. of Illinois National Guard, Capitol Airport, from Sangamo Constr. Co., 700 N. MacArthur Blvd., **$244,570;** hangar, from John Felmly, Bloomington, **$519,600.** Est. $1,200,000. CD 4/13.

Wis., Milwaukee — AIRPORT IMPRVS. — Milwaukee Co., Courthouse, Apr. 21, imprv. airport General Mitchell Field, from Joseph D. Bonness, Inc., 1409 N. 27 St., Zone 8, **$716,319.** Est. $847,457. CD 4/5—ENR 4/7.

Wis., Wausau — AIRPORT — City, grading, airport, from Thornton Constr. Co., Hancock, Mich., **$207,000;** paving, from White Constr. Co., 2543 W. Greves St., Milwaukee, Zone 3, **$165,683.** CD 4/5—ENR 4/7.

CONTRACTS AWARDED

†Tex., Fort Worth — GRAVEL PAVING — U. S. Eng., Carswell Air Force Base, Fort Worth, 150,000 cu. yd. gravel paving, Carswell Air Force Base, Purchase and Hire, **$90,000.**

PUBLIC BUILDINGS

BIDS ASKED

May 2

N. Y., Wyandanch—Bd. Educ., Union Free School Dist. 9, Straight Path, Wyandanch school addn. $285,000. Shirley & De Shaw, Grand Central Terminal Bldg., New York, Zone 17, archts.

May 5

N. Y., East Meadow—Bd. Educ., Union Free School Dist. 3, Front St., school $408,000. Plans deposit $50. Frederick P. Wiedersum, 240 Rockaway Ave., Valley Stream, archt.

May 6

†N. D., Riverdale—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, converting temporary administration bldg. to Dormitory Hotel Annex, Serial No. Eng-32-015-49-80. Extended date. CD 4/13—ENR 4/21.

May 9

Colo., Longmont—School Dist. 17, Longmont, Central Grade School addn., $340,000; Columbine, elementary School addns., $265,000. T. H. Buell & Co., 730 14 St., Denver, engrs. and archts. CD 10/10/46—ENR 10/31/46.

May 10

†California—U. S. Eng., Wright Bldg., Sacramento, government housing, Pine Flat Dam Proj., near Piedra, Serial No. Eng-04-167-49-69.

†Calif., Inyokern — Yards & Docks, Navy Dpt., Inyokern, 4 rein.-con. bldgs., magazines, steel water reservoir, walks, roads, water and sewer sys. Approx. $250,000. Plans deposit $150.

La., Scotlandville — Baton Rouge Parish School Bd., Scotlandville, 2 story, steel, masonry school. Plans deposit $30. Bodman & Murrell, 713 Reymond Bldg., Baton Rouge, archt.

†Tex., Fort Bliss (El Paso P. O.)—U. S. Eng., Post Quartermaster, Purchasing and Contracting Div., Fort Bliss, replacing wooden docks with concrete docks for number of existing bldgs., Serial No. Eng-41-014-49-67. $50,000.

May 11

●N. Y., Watertown—Bd. Educ., Watertown, high school $2,000,000. Plans deposit $35. Wallace P. Beardsley, Seward Block, Auburn, and Sargent, Webster, Crenshaw & Foley, 2112 Erie Blvd., Syracuse, archts. CD 10/23/44—ENR 11/2/44.

S. C., Columbia—South Carolina Sanatorium, State Park, Richland Co., construct Palmetto Div. and kitchen. Plans deposit $50. James B. Urquhart, Palmetto Bldg., archt. CD 4/19—ENR 4/21.

May 12

Tex., Dallas—Dallas Co. and City, 1 and 2 story masonry juvenile detention home and administration bldg. for boys and girls, rein.-con. fdn. and frame, air-conditioning, $250,000. Maurice Peterman, archt. and W. D. Robinson, structural engr., 4303 Trellis Court. Herman Blum, 2812 Fiarmont St., mechanical engr. CD 12/3—ENR 12/23.

May 18

†N. M., Albuquerque—U. S .Eng., P. O. Box 1538, Albuquerque, heating plant addn., addnl. steam distr. sys., EOP 917, Sandia Base, Serial No. Eng-29-005-49-86.

On or About May 19

†Ala., Anniston—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, 52x90 ft. motor vehicle storage bldg., incl. utilities to line 5 ft. outside the structure, Inv. Ser. No. 01-079-49-23.

†Ala., Athens—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., 52x74 ft. motor vehicle storage bldg., incl. utilities to a line 5 ft. outside structure, Inv. Serial No. 01-079-49-221.

†Ala., Bessemer—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, 52x90 ft. motor vehicle storage bldg., incl. utilities to line 5 ft. outside the structure, Inv. Ser. No. 01-079-49-25.

†Ala., Luverne—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, 52x90 ft. motor vehicle storage bldg., incl. utilities to line 5 ft. outside the structure, Inv. Ser. No. 01-079-49-24.

About May 19

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, erecting 4 butler bldgs. EOP 940. Sandia Base, Serial No. Eng-29-005-49-87.

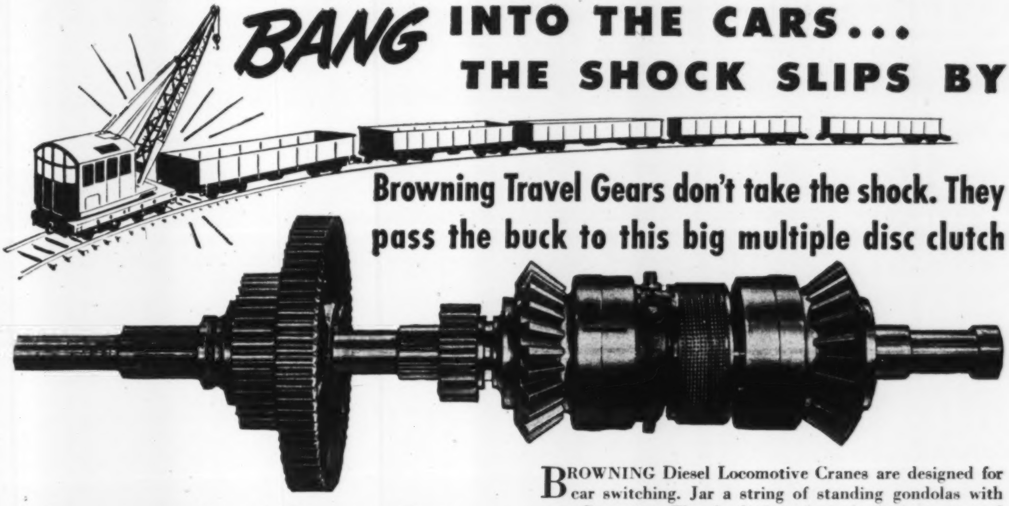
O., Upper Arlington—Bd. Educ., Upper Arlington City School Dist., J. S. Collins, clk., 2100 Devon Rd., school addns., Andover Rd. Benham, Richards & Armstrong, 167 E. State St., Columbus Zone 15, archts. CD 2/25—ENR 3/17.

May 20

N. C., Pinehurst—Moore County Hospital, Pinehurst, 42 bed hospital addn., alterations. Plans deposit $30 for general, $20 for mechanical. Walter W. Hook & Assoc., 305 4 St., Charlotte, archts. CD 4/12—ENR 4/14.

†South Dakota—U. S. Eng., 1709 Jackson St., Omaha, Neb., housing, facilities, Stage I, Oahe Reservoir, Proj. Inv. No. 25-066-49-233. CD 4/20.

(Continued on page 124)



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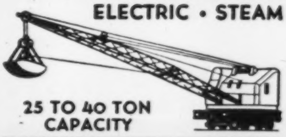

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A MOUTHFUL AT EVERY BITE

(Continued from page 122)

About May 28

†Pa., Pittsburgh—U. S. Eng., 925 New Federal Bldg., sub-foundation on preparation for Veterans Admin. General Medical Hospital, Serial No. Eng-36-058-49-60, for Veterans Admin., Vermot Ave. between H and I Sts. N.W., Wash. 25, D. C. CD 5/16/47—ENR 5/29/47.

About June 7

†N. H., Franklin—U. S. Eng., Army Base, Boston 10, Mass., garage and utility bldg., Franklin Falls Dam.

June 7

†Wash., Walla Walla—Veterans Admin., Munitions Bldg., Wash. 25, D. C., boilers and equip. in Boiler House Bldg. 74, for Veterans Admin. Hospital, Spec. 4904. CD 6/13/45—ENR 6/21/45.

LOW BIDDERS

●Kan., Kansas City—Bd. P. Utilities, c/o Gerard B. Little, secy., City Hall, Apr. 20, chemical bldg., basins, from S. Patti Constr. Co., 1340 Admiral Blvd., **$1,499,800.** CD 4/12—ENR 4/14.

Miss., Columbus—State Bldg. Comn., Jackson, Apr. 19, classroom bldg., Mississippi State College for Women, from Building Service Co., West Point, **$344,988.** CD 3/4—ENR 3/10.

†Pa., Altoona—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Apr. 12, quarters bldgs. on site of Veterans Admin. Hospital for Serial No. Eng-36-058-49-97, for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C. from Mellon-Stuart Co., 210 East Park Way, Pittsburgh, Zone 12, **$299,626.** Est. $304,216. CD 3/18—ENR 3/24.

Tenn., Bristol—Sullivan County Bd. Educ., Bristol, Apr. 13, Haynesfield and Holston Heights Elementary School addns., from Cassell Bros., Kingsport, **$296,890.** CD 3/30—ENR 4/7.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., Apr. 20, 3 story structural steel Jeff Davis High School addn., remodeling existing school, etc., from Thomas Bate & Son, 1107 Girard St., **$617,000.** CD 3/22—ENR 3/24.

CONTRACTS AWARDED

●†Ky., Fort Knox—U. S. Eng., 830 W. Broadway, Louisville, sixteen 2 story, brick, wood, concrete houses, to Struck Constr. Co., 147 N. Clay St., Louisville, **$1,731,028.** Bids 4/15. CD 4/21—ENR 4/28, under LB.

Md., Baltimore—Mayor & City Council, City Hall, 2 story, brick gymnasium addn., 5 story, brick bldg. addn., Dunbar Junior Senior High School Caroline, McElderry and Eden Sts., to Charles R. Scrivener Co., 339 St. Paul Pl., **$943,830.** Bids 4/13, awarded 4/21. CD 4/19—ENR 4/21, under LB.

Md., Towson—Bd. Educ. Baltimore Co., Towson, 2 story, Gray Manor School, to Joseph F. Hughes & Co., 511 N. Charles St., Baltimore, **$824,572.** Bids 4/6. CD 3/30.

Mo., Hannibal—City, Supt. Bd. P. Wks., municipal power plant improvs., incl. power piping, and insulation, to Winger Constr. Co., 1200 E. Main St., Ottumwa, Ia., **$83,600.**

N. C., Kinston—Caswell Training School, N. C. Hospitals Bd. Control, R. M. Pursel, genl. mgr., Raleigh, boys and girls dormitories, to O. W. Godwin, Dunn, **$560,285.** Bids 4/20. CD 3/30—ENR 4/7.

COMMERCIAL BUILDINGS

BIDS ASKED

May 3

●N. Y., New York—Home & Hospital of the Daughters of Jacob, 167 St. and Franklin Ave., home and hospital, $2,000,000. Charles B. Meyers, 31 Union Square, archt. CD 4/21/48—ENR 5/13/48.

May 4

Mo., St. Louis—St. Ambrose Catholic Parish, c/o Rev. Raymond F. Diermann, pastor, 2100 Marconi St., Zone 10, 2 story, 57x189 ft., brick, rein.-con. stone school, Henry P. Hess, 4005 W. Florissant Ave., Zone 7, archt. CD 8/12—ENR 8/26.

May 14

N. Y., Gouverneur—Edward J. Noble Hospital, Gouverneur, hospital, Skidmore, Owings & Merrill, 5 E. 57 St., New York, Zone 22, and Sargent, Webster, Crenshaw & Foley, National Bank Bldg., Watertown, archts.

SOON LETS CONTRACT

Calif., San Jose—Mr. Griffith, c/o Donnell E. Jaekle, archt., Builders Exchange Bldg., soon lets contract 3 story, structural steel, rein.-con. apartment incl. 48 two and three room apartments with garage, and bsmnt. $250,000.

N. C., Hendersonville—At office E. C. Houston, ch. engr., Southern Bell Telephone & Telegraph Co., Hurt Bldg., Atlanta, Ga., soon lets contract dial and toll office bldg. Extended date. J. N. Pease & Co., 119½ E. 5 St., Charlotte, archts. and engrs. CD 4/20—ENR 4/28.

Proposal Advertisements see pp. 124 to 126
Proposed Projects see p. 97

OFFICIAL PROPOSALS

Bids: May 3, 1949 (103)

Furnishing Cast Iron Water Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 642-W

Sealed proposals for furnishing and delivering 12,000 feet of 12-inch and 8,000 feet of 16-inch Class 150 Cast Iron Water Pipe will be received at the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland, until 1:50 P.M. Eastern Daylight Saving Time, Tuesday May 3, 1949 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt (Chairman)
Lacy Shaw
Leland G. Worthington
Commissioners

Bids: May 3, 1949 (102)

Furnishing Cast Iron Water Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 641-W

Sealed proposals for furnishing and delivering 40,000 feet of 6-inch, 35,000 feet of 8-inch and 5,000 feet of 10-inch Class 150 cast iron water pipe will be received at the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland, until 1:40 P.M., Eastern Daylight Saving Time, Tuesday May 3, 1949 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt (Chairman)
Lacy Shaw
Leland G. Worthington
Commissioners

Bids: May 16, 1948 (999)

Storm Drains

TOWN OF TONAWANDA, ERIE COUNTY, NEW YORK

Bids—May 16, 1949

Sealed proposals for the construction of storm drains will be received at the Council Room of the Municipal Building, Kenmore, New York, until 8:00 P.M. Eastern Daylight Saving Time on May 16, 1949, at which time they will be publicly opened and read.

The work is divided into three sections, designated as Sections F, H, and J, and bids may be submitted on any one or more sections.

Section F includes approximately 7,550 feet of 7 foot by 7 foot concrete conduit together with special structures, manholes, and appurtenances.

Section H includes approximate lengths of reinforced concrete pipe as follows, with special structures, manholes, and appurtenances:

1,420 feet of 78 inch pipe
420 feet of 72 inch pipe
720 feet of 66 inch pipe
940 feet of 60 inch pipe
900 feet of 54 inch pipe

Section J includes approximate lengths of reinforced concrete pipe as follows, with special structures, manholes, and appurtenances:

375 feet of 42 inch pipe
250 feet of 36 inch pipe
510 feet of 33 inch pipe
280 feet of 50 inch pipe
270 feet of 27 inch pipe
250 feet of 24 inch pipe

Proposal forms, plans and specifications may be obtained at the office of Nussbaumer and Clarke, the Consulting Engineers, 327 Franklin St., Buffalo 2, New York, upon deposit of $30.00 for Section J, $50.00 each for Sections F and H, or $80.00 for any two or more sections. The deposit will be refunded in full to any bidder upon returning of the plans and documents in good condition within 20 days after taking of bids. Non-bidders will be similarly refunded half of the deposit.

Each bid must be accompanied by security in the form and amount set forth in the Instructions to Bidders.

Chester A. Tilghman
TOWN CLERK

OFFICIAL PROPOSALS

Bids: May 18, 1949 (100)

Addition to Motor Vehicle Testing Lane

ADVERTISEMENT FOR BIDS

Sealed proposals will be received by the State Highway Department at its offices, Dover, Delaware, until 2:00 P. M., E.D.S.T. (1:00 P.M., E.S.T.), May 18, 1949, and at that time and place publicly opened for the following contract:

CONTRACT 1046
ADDITION TO MOTOR VEHICLE TESTING LANE
Wilmington, Delaware

The Employment Agency for this contract shall be the Delaware State Employment Service Office, 601 Shipley Street, Wilmington, Delaware.

Attention is called to the Special Provisions in the proposal, specifications and contract agreement.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed as specified.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the architect.

Each proposal must be accompanied by a surety bond, certified check, or money to the amount of at least ten (10) per centum of the total amount of the proposal.

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

The right is reserved to reject any or all bids.

Complete sets of plans and specifications may be obtained after May 2, 1949 from the architect upon payment of ten dollars ($10.00) for each set, which amount will not be refunded. Make all checks payable to Victorine and Samuel Homsey, Architects.

STATE HIGHWAY DEPARTMENT
By: J. Gordon Smith, Chairman
W. A. McWilliams, Chief Engineer.
Dover, Delaware
Victorine & Samuel Homsey, Architects
917 Gilpin Avenue
Wilmington, Delaware

Bids: June 15, 1949 (101)

Construction of Preliminary Treatment Plant

Department of Public Works, Bureau of Water, Philadelphia, Penna.

Sealed proposals will be received at room 903, City Hall Annex, until 12 o'clock noon, Eastern Daylight Saving Time, Wednesday, June 15, 1949 and opened at that time in room 1025, City Hall Annex, for the following contract:

126-WWI—Construction of Preliminary Treatment Plant and Appurtenances at Queen Lane Filter Plant. (READVERTISEMENT)

The contract will consist of the construction of concrete basins, substructure of Chemical Building, conduits, shafts, sewers and appurtenant structures and furnishing and installing mixing and sludge collecting equipment, meters, valves, piping, sluice gates and all appurtenant work and equipment.

Plans, Specifications, Forms of Proposal and Contract and Prequalification Questionnaire may be examined or copies obtained at the Office of the Bureau of Water, Room 819 City Hall Annex, upon making a deposit of $25.00 by check, made payable to the City Treasurer of the City of Philadelphia, which will be refunded upon return of the plans and specifications in good condition within ten (10) days after the contract is awarded.

Each proposal shall be accompanied by either a certified check or certifiate of deposit issued by a responsible bank or trust company, or bonds of the City of Philadelphia for the amount specified in the City Ordinance approved October 29, 1940, copy of which forms a part of the contract documents.

NOTICE: No bid for this work will be received unless the Prequalification Questionnaire of the bidder, with all questions full answered has been filed with the Director of the Department of Public Works at least one (1) week before the date of opening bids.

Thomas Buckley,
Director

(Continued on page 125)

(Continued from page 124)

Bids: May 4, 1949 (984)

State Highway Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Chapter 63 Laws of 1936, as amended, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on Wednesday, May 4, 1949 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1						
G. L. Nickerson, Dist. Engr., 353 Broadway, Albany, N. Y:						
Warren	RC 49-46	Glens Falls-Lake George, S.H. 417 Luzerne-Lake George Pt. 2, S. H. 805	2.30	Asph. Conc. Opt.	$4,500 Plans $5.00	$81,000
DISTRICT No. 2						
L. Ketchum, Dist. Engr., 109 No. Genesee St., Utica, N. Y:						
Madison	FARC 49-47	Cazenovia-Morrisville, S. H. 5329 Morrisville-Bouckville, S. H. 5330 Cazenovia Village Pt. 2, S. H. 8119 Proj. F190(3), F295(3)	12.68	Road Side Improvement	$6,000 Plans $5.00	$100,000
DISTRICT No. 4						
A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.						
Monroe	RC 49-48	Hamlin Pt. 2, S. H. 81	2.48	(Road Mix.) Bit. Mac. Opt.	$5,000 Plans $5.00	$91,000
DISTRICT No. 5						
C. R. Waters, Dist. Engr., 65 Court St., Buffalo, N. Y.						
Cattaraugus	ASP 49-1	Allegany State Park English Stoddard & Quaker Run Rds.	11.05	Brk. Stone Single Surf. Treat. (or) Brk. Slag Single Surf. Treat.	$1,000 Plans $5.00	$17,483 or $19,368
DISTRICT No. 8						
J. S. Bixby, Dist. Eng., Pleasant Valley Rd., Poughkeepsie, N. Y:						
Westchester	RC 49-50	White Plains-Rye Lake, S. H. 5226	0.90	Asph. Conc. Opt.	$2,500 Plans $5.00	$47,000
Westchester	FGRC 49-51 FARC 49-52	Separation of Grades, N. Y. C.R.R. with Whitehall Cors., Rights Cors. S. H. 1324 Proj. F 643(11); Proj. FG 643(11)	0.58	Rig. Fr. 40′, 50′, 60′ IB (Alpha)90′ (Alpha $219.10) Conc. 8″ Thk. 22′-48′ Wdt.	$25,000 Plans $5.00	$428,000
DISTRICT No. 10						
J. J. Darcy Dist. Eng., Montauk Hwy at Little East Neck Rd., Babylon, Long Island, N. Y.						
Bronx	FAMDE 49-1	Maj. Deegan Exp. Cont. 1A Proj. U-1082(2)	0.72	Service Rds. Pavt. Grd. & Drain	$150,000 Plans $20.00	$2,600,000
Nassau	FARC 49-49	North Hempstead Turnpike S. H. 9018 Proj. F541(7)	1.17	Conc. 9″ Thk., 61′ & Var.	$40,000 Plans $10.00	$685,000
Suffolk	SSP 49-2	Southern State Parkway; Deer Park Ave. to Howells Rd.	2.16	Conc. 8″ Thk. 2 @ 25′ Wdt.	$40,000 Plans $20.00	$693,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: May 10, 1949 **(990)**

Sections of Outfall Sewer

NOTICE TO BIDDERS
THE LINDEN ROSELLE SEWERAGE AUTHORITY
LINDEN, N. J.

1. Sealed proposals for the construction of CONTRACT "1A", being a portion of an Outfall Sewer in the CITY OF LINDEN, NEW JERSEY, will be received by the Linden Roselle Sewerage Authority at its meeting place in the Linden Public Library at Linden, until 8:00 P. M. on Tuesday, May 10, 1949, and there publicly opened and read immediately thereafter.

2. The work will consist of providing all labor, materials, equipment and incidentals required for the construction of approximately 460 feet of Sixty-inch Diameter Reinforced Concrete Sewer Pipe and appurtenances across the proposed New Jersey State Highway Route 100 and approach road thereto.

3. Plans, Specifications, Bidding and Contract Documents may be examined at the Office of the Consulting Engineers, ALEXANDER POTTER ASSOCIATES, 50 Church Street, New York 7, N. Y., and there obtained upon Deposit of TEN ($10.00) DOLLARS PER SET. Full refund will be made to actual bidders for return of One (1) set, in good condition, within Ten (10) Days after closing date for Receipt of Bids; refund for return of all other sets, in good condition, within the same period, will be Fifty Percent (50%) of the deposit.

4. All proposals must be on the form furnished by the Authority.

5. All bids must be accompanied by a Certified Check or acceptable Bidders' Bond in the amount of TEN (10%) PER CENT of the amount of the Bid, made payable to the Linden Roselle Sewerage Authority. Said checks or bonds will be returned to the unsuccessful bidders not later than Thirty (30) Days after Opening Of Bids.

6. The successful bidder will be required to furnish a Performance Bond conditioned upon the faithful performance of the Contract and upon the payment of all persons supplying labor and furnishing materials on the construction of the work.

7. No bidder may withdraw his bid within Thirty (30) days after closing date for receipt of bids.

8. The Authority reserves the right to reject any or all bids, and to waive any informality in the bid.

BY ORDER OF THE SECRETARY OF THE LINDEN ROSELLE SEWERAGE
HERBERT D. BANTA
Dated April 21, 1949

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(997)

ASWAN DAM HYDRO-ELECTRIC SCHEME
EGYPTIAN GOVERNMENT
MINISTRY OF PUBLIC WORKS
HYDRO-ELECTRIC POWER COMMISSION
GENERAL ADJUDICATION

The Egyptian government hereby announces that tenderers are invited for the supply, erection and maintenance of the civil engineering and building works including excavation involved in the construction of the hydro-electric power station at the Aswan Dam all according to the specifications. The specifications and conditions of contract may be obtained either at the hydro-electric power department, 10 Mamal El Sokker street, Garden City, Cairo or the office of the consulting engineers of the Egyptian government, Messrs. Kennedy and Donkin, 12 Caxton street, London, S. W. 1 or the Royal Egyptian Embassy in Washington, Paris or Legation in Stockholm, Berne and Brussels as from April 30th, 1949. Tenderers must pay fifty Egypian pounds which covers the cost of one complete set of the specification drawings and conditions of contract. This sum must be paid to the National Bank of Egypt either in Cairo or in London to the credit of the hydro-electric power department (ministry of public works) or at one of the above mentioned embassies or legations and will not be refunded. Upon presentation of the bank receipt to either the hydro-electric power department in Cairo or the consulting engineers in London or on the payment of the required sums at one of the above mentioned legations as the case may be, tenderers will be supplied with one complete set of the conditions of contract specifications and drawings for the entire works. When submitting their tenders, tenderers must pay a provisional deposit of two percent of the value of the contract with a maximum of fifty thousand Egyptian pounds to the National Bank of Egypt in Cairo or in London to the credit of the hydro-electric power department of the ministry of public works. Letters of guarantee from approved banks will be accepted in lieu of cash. A list of approved banks is given in the specifications.

Bids: May 19, 1949 (995)

Barges & Towing Service

SEALED PROPOSALS

Notice is hereby given that sealed proposals for furnishing, maintaining and operating one or more barges and towing service for the transportation of sewage sludge from a private wharf on Arthur Kill, in the City of Elizabeth, New Jersey, to a point at sea for a period of one, two, three, four or five years, will be received by the Joint Meeting for certain muncipalities in Essex and Union counties, New Jersey.

Said proposals will be received in the Council Chamber, City Hall, East Orange, New Jersey at 4:00 p.m. Eastern Daylight Savings Time, on Thursday, May 19, 1949, at which time they will be publicly opened and read. Information concerning this work, blank forms of questionnaires, specifications, and proposals forms may be obtained from the office of the secretary of Joint Meeting, room 311, City Hall, Newark, New Jersey.

The Joint Meeting reserves the right to reject any or all proposals and also reserves the right to waive any informality in the bid and to accept the bid which, in its judgment, best serves the interest of the contracting muncipalities.

By order of the Joint Meeting.
G. Harry Cullis, Chairman
Edward P. Decher
Secretary

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota. Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of Stage No. 2, Spillway and Embankment Closure, Home Dam, Park River, North Dakota, will be received in this office until 11:00 A.M., C.S.T., 17 May 1949, and then publicly opened. Further information upon application.

(998)

(Continued on page 126)

U. S. Government

(Continued from page 125)

NORTH PLATTE PROJECT
Design Unit
Casper, Wyoming
April 8, 1949

UNITED STATES
Department of the Interior
Bureau of Reclamation

NOTICE IS HEREBY GIVEN that sealed bids will be received at Casper, Wyoming, until 10:00 a.m., Mountain Standard Time, May 12, 1949, and then publicly opened, for furnishing labor and materials and performing all work for the construction of a Parshall Flume, on the Fort Laramie Canal, at Station 41 + 01.5, Rehabilitation and Betterments Program, North Platte Project, Nebraska-Wyoming. The site of the work is situated approximately 5½ miles west and 2 miles north of Fort Laramie, Wyoming.

Principle items of work and material are as follows:

57 cu. yds. Excavation for Structures
20,000 pounds Furnishing and placing reinforcing steel
12 lin. ft. Furnishing and installing galvanized steel pipe
65 pounds Furnishing and installing structural steel
225 barrels Furnishing and handling cement
170 cu. yds. Concrete in structure
1280 cu. yds. Backfill about structure
280 cu. yds. Compacting backfill
25 cu. yds. Riprap
26 sq. ft. Furnishing and placing elastic filler material in joint.
38 lin. ft. Furnishing and placing rubber water stop in joint.

Copies of the standard forms and of the specifications may be obtained from the following office of the Bureau of Reclamation: I. J. Matthews, District Manager, Casper, Wyoming. No charge to prospective bidders for copies of the specifications and drawings; to others $.25 per copy, not returnable.

MICHAEL W. STRAUSS, Commissioner
(996)

OFFICIAL PROPOSALS

Bids: May 19, 1949 (989)

Intercepting Sewer

Sealed proposals will be received at the office of the Department of Service and Buildings of the City of Dayton, State of Ohio until 12:00 o'clock noon Thursday, Eastern Standard Time, May 19, 1949, for furnishing all materials and constructing Section one of an Interceptor Sewer in the bed of the Great Miami River from Longworth Street to Floral Avenue, and thereafter will be publicly opened and read.

This section consists primarily of approximately 9500 linear feet of reinforced concrete box sewer varying in size from 7′-9″ × 4′-9″ to 10′-5″ × 3′-6″ and appurtenant structures. The location is in the bed of the Great Miami River between low water and the toe of the levee. The project may be bid as a whole or in two parts, which are approximately equal. It is to be assumed that the total cost of the improvement will not exceed $844,497.47. Bids shall be accompanied by a certified check upon some solvent bank or a bond executed by a surety company authorized to do business in Ohio or a bond of the United States or the City of Dayton for a sum equal to 5% of the amount of the bid submitted as a guarantee that if the bid is accepted that a contract will be entered into and its performance properly secured. Plans, specifications, and proposal forms may be obtained from the Director of Service and Buildings, Municipal Building, Dayton 2, Ohio upon payment of $15.00 for each set. Checks shall be made payable to the City of Dayton. No refund will be made for the return of the plans. The City reserves the right to reject any or all bids or to accept the proposal which appears most advantageous.

George F. Baker
Director of Service and Buildings
Municipal Building
Dayton 2, Ohio

Bids: May 12, 1949 (994)

Construction Work At Wold-Chamberlain Field

MINNEAPOLIS, MINNESOTA

BIDS CLOSE AT 10:00 A.M. ON THE 12th DAY OF MAY, 1949.

NOTICE TO CONTRACTORS:

Sealed bids for construction of Schedules III and IV of first stage improvements to Wold-Chamberlain Field, owned and being operated by the Minneapolis-Saint Paul Metropolitan Airports Commission, a public corporation, located in the City of Minneapolis and the Village of Richfield in Hennepin County, Minnesota, will be received by the Minneapolis-Saint Paul Metropolitan Airports Commission at the office thereof, located at 2429 University Avenue, St. Paul 4, Minnesota, until the hour of 10:00 A.M., on the 12th day of May, 1949, and will be publicly opened and read aloud immediately thereafter. The work, in accordance with plans and specifications prepared by Toltz, King and Day, Inc., Engineers and Architects, St. Paul, Minnesota, consists of approximately the following quantities of the major items of work:

SCHEDULE III

Excavation	1,200,000 Cu. Yds.
Storm Sewers (12″ to 60″)	28,000 Lin. Ft.
Manholes and Catch Basins	115 Structures
Cyclone Type Fencing	14,000 Lin. Ft.
Rip Rap	1,500 sq. yds
7′-9″ Dia. Tunnel under Runway	170 Lin. Ft.

SCHEDULE IV

Electrical Manholes	4 Structures
Transformers	2 Transformers
Ducts and Conduit (4 Bank to 16 Bank)	650 Lin. Ft.
Primary Cable	1,500 Lin. Ft.
Weatherproof Cable	1,500 Lin. Ft.

Separate proposals are required for Schedules III and IV. Proposals shall be on blanks furnished for that purpose.

The schedule of minimum wages as established by the Secretary of Labor and set forth in the special provisions, constituting a part of the plans and specifications, are to govern on this project, and bids shall be based on these established minimum wage rates.

Each bid must be accompanied by a certified check made payable to the Minneapolis-Saint Paul Metropolitan Airports Commission, in an amount not less than 5% of the total bid, or a surety bond in the same amount running to the Commission with a surety company thereon as surety duly authorized to do business in the State of Minnesota, as a guaranty that the bidder, if successful, will enter into a contract with the Minneapolis-Saint Paul Metropolitan Airports Commission and in connection therewith give bond as required by law, the amount of the check to be retained or the bond enforced by the Commission in case he fails to do so. All bid guarantees, except those of the two low bidders, will be returned within five (5) days after the opening of bids. The bid guarantee of the second low bidder will be returned within ten (10) days after the opening of bids.

No bidder may withdraw his bid for a period of forty-five (45) days after the date for the opening thereof. The Minneapolis-Saint Paul Metropolitan Airports Commission reserves the right to reject any or all bids and readvertise for new bids.

Plans and specifications are on file for inspection at the office of the Minneapolis-Saint Paul Metropolitan Airports Commission and the office of Toltz, King and Day, Inc., 1509 Pioneer Building, St. Paul 1, Minnesota. Contractors desiring plans and specifications for personal use may secure them from said Toltz, King and Day, Inc., upon deposit of $25.00 for each set of plans, except cross sections, and specifications for Schedule III, and $15.00 for each set for Schedule IV. $15.00 and $10.00, respectively, of these deposits will be returned upon return of the plans in good condition within a reasonable time after the date of opening of said bids. Cross sections may be obtained upon payment of an additional $20.00. No refund will be made for return of cross sections.

Dated at St. Paul, Minnesota, April 13, 1949.

Minneapolis-Saint Paul Metropolitan Airports Commission
By Robert Aldrich
Executive Director
2429 University Avenue
St. Paul 4, Minnesota

EMPLOYMENT

(Additional Employment Advertising on page 127)

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

WANTED: BY Missouri State Highway Department, Jefferson City, Missouri, several experienced detailers and designers on reinforced concrete and steel bridges. Permanent position. Salary range up to $400 per month. Give complete details of education and experience.

WANTED: OFFICE Engineer for county highway department, duties will consist of office work generally, must be able to plan road grades, calculate earthwork, quantities and work up plans for culvert and bridge work. Contact County Engineer's Office, Guthrie Center, Iowa.

MUNICIPAL ENGINEER. Registered professional engineer with at least four years of professional experience, preferably in design and construction of sewers. Starting salary: $4200-$5000 a year, depending on experience. Permanent position. Apply to Personnel Supervisor, City of Dayton, Ohio, stating age, education and experience.

EXPERIENCED
ORNAMENTAL IRON DRAFTSMAN
Excellent opportunity with live growing organization in the South. Apply giving age, experience, references and salary required.
SOUTHERN ENGINEERING COMPANY
Charlotte, N. C.

POSITIONS VACANT

BRIDGE DESIGNER Wanted: At least four years of experience in design of highway bridges. Must be familiar with design of intermediate structures, and capable of executing complete structural designs of small bridges and elevated structures. Must be a graduate civil engineer. Location—Washington, D. C. Salary at approximately $5200.00 per annum with periodic increases. Annual leave—26 days a year. Pension plan. P-8784, Engineering News-Record.

ESTIMATOR FOR general building construction and job supervision, knowledge in estimating sewer, water main and highways very desirable. Excellent permanent opportunity. Submit qualifications, salary expected and when available. Replies confidential. P-8768, Engineering News-Record.

(Continued on page 127)

DESIGNER WANTED
For Pressure Vessels and Heat Exchangers

Prefer man familiar with present shop fabricating practices. Perm. position in Kansas City. Liberal employee benefits. Give Qualifications.

P-8639, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED—Mechanical and Structural Engineers For designing and detailing work on concrete reinforcement, structural steel and hangar door construction. Requirements are three to four years practical experience or recent graduation from technical school. Desirable working conditions and opportunities for advancement. These openings are with a nationally known steel fabricating company, located in eastern Ohio. Applicants will please submit a record of their qualifications.

P-7737, Eng. N-R, 520 N. Mich. Ave., Chicago

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

(Not available for equipment advertising)

$1.20 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.

INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.00 a line an insertion.

INFORMATION.

BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS received by May 3rd appear in May 12th issue subject to limitation of space available.

SALARIED POSITIONS $3.500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT

WANTED—ENGINEERS, Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

WANTED—BRIDGE Superintendent for reinforced concrete girder, box type bridge. Location Pacific Northwest. P-8687, Engineering News-Record.

WANTED: EXPERIENCED estimators, by large, established general contractor for work in New Mexico. Please write Engineering News-Record, P-8690 giving in detail, education, age, experience and family status P-8690. Engineering News-Record.

WANTED: ESTIMATOR for heating, plumbing, air-conditioning contractor located in Central Pennsylvania. State age, qualifications, experience and salary expected in first letter. P-8759, Engineering News-Record.

STRUCTURAL ENGINEER about 35-40, thoroughly experienced in reinforced concrete design. Willing to travel. Headquarters Kansas City. P-8755, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

WANTED FOR New England territory, manufacturers agent to represent a well known company engaged in specialized foundation work. One handling allied lines and having good contacts with architects, engineers and contractors preferred. Commissions on gross sales. RW-8743, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION SUPT.—Water Purification or Sewage Disposal. Thoroughly experienced. Also competent estimator. PW-8676, Engineering News-Record.

SQUAD LEADER—Structural Civil Registered. 9 yrs. industrial experience. Age 34. All locations considered. PW-8675, Engineering News-Record

(Continued on page 128)

LUMBER SALESMAN

with good following among large general contractors, wanted by well established lumber yard. Capable producing volume business. Write stating age, and experience to

SW-8761, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

MAN WANTED

SALES ENGINEER

For selling and promoting asphalt construction and materials. Permanent position and excellent opportunity for right man. State qualifications and references.

SW-8369, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS

SANITARY AND STRUCTURAL

Excellent opportunities for immediate permanent employment with a progressive organization. Experience essential in sanitary and/or structural design, specification writing and report preparation for water and sewage treatment plants. Engineers experienced in valuation and rate studies also needed.

Desirable working conditions at salary commensurate with ability. Write for application blank. All replies will be held confidential and will be promptly acknowledged.

CAPITOL ENGINEERING CORPORATION
DILLSBURG, YORK COUNTY PENNSYLVANIA

WANTED

CONSTRUCTION EXECUTIVE

A permanent position is available in a nationally known Western construction organization for a highly qualified construction executive. Only those with extensive management and field construction experience should apply. Write giving full particulars which will be held confidential. Our employees know of this ad. Salary open.

P-8774, Engineering News-Record
68 Post Street, San Francisco 4, Calif.

WANTED

CONSTRUCTION SUPERINTENDENT

WITH REFINERY AND HEAVY CONSTRUCTION EXPERIENCE. LOCATION SOUTH NEW JERSEY AND EASTERN PENNSYLVANIA. STATE AGE, EXPERIENCE AND FULL PARTICULARS.

P-8582, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

SUPERINTENDENT

Experienced in road and sewer construction.

State age and experience.

Permanent position in small organization.

Vicinity—Union, Middlesex and Somerset Counties, N. J.

P-8794, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

Fabricated Structural Steel

OFFICE MANAGER

New York City fabricator and erector of structural steel for buildings has excellent opportunity for right man. Applicant must have had experience with structural steel fabricator of approximately 5,000 to 15,000 tons yearly capacity. Consideration will also be given to the following:

- **Accounting or management and industrial engineering background.**
- **Administrative experience supervising cost system, purchasing and office procedure.**

Write full particulars and salary expected in confidence. Out of town applicant will be assisted in locating suitable living quarters.

GRAND IRON WORKS, INC.
525 Tiffany Street, New York 59 N, Y.

WANTED

CHIEF DRAFTSMAN

age 25 to 50, structural design background with broad supervisory design experience on tunnels, bridges, harbors and municipal work, by Southern engineering firm. Must be able to work with management, lead men and get results. Salary commensurate with ability. Submit record education, experience, availability and references to

P-8532, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

(Continued from page 127)

MASTER MECHANIC, service manager or shop foreman, age 42, experienced supervisor in the operation, repair and maintenance of heavy equipment, all phases of shop management, parts, etc., free to travel and can furnish the best of references. PW-8698, Engineering News-Record.

EXPERIENCED ESTIMATOR, Construction Engineer, well grounded in costs. 22 years with prominent general contracting firms, as chief engineer and business manager. Experience includes bidding and negotiating contracts, organizing and managing construction projects. PW-8692, Engineering News-Record.

CONCRETE SUPERINTENDENT: 28 years in concrete field. Aggregate, batch and crushing plants. Producing 200 to 900 yds. daily. Thoroughly experienced in all phases of concrete. Foreign position preferred. PW-8694, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: over 15 years experience in commercial, industrial, and governmental work. Excellent references. PW-8317, Engineering News-Record.

PROJECT MANAGER or General Superintendent—with 25 years broad managerial experience. Design-construction-supervision; in heavy construction, industrial buildings, government projects now available. PW-8707, Engineering News-Record.

PROJECT MANAGER: General, Job Superintendent; 30 years experience; heavy and light construction; housing; apartments; schools; hospitals; office buildings; chemical; industrial plants; powerhouses; handle all trades including mechanical and allied work. PW-8576, Engineering News-Record.

ACCOUNTANT, 54, desires location. Prefer foreign. 33 years bookkeeping, cost accounts and other essential. 5½ years in Tropics. Have some knowledge of Spanish. Valid passport. P. O. Box 124, Lenoir City, Tenn.

STRUCTURAL DESIGN Engineer, Graduate C.E., Age 45, 23 years experience designing steel, concrete and timber structures, together with any type of foundation. Thoroughly competent to execute complete structural designs on any type building or waterfront structure, and supervise the execution of working drawings. Correspondence invited for position of responsibility. PW-7208, Engineering News-Record.

PROJECT MANAGER or General Superintendent over 20 years experience on heavy construction, industrial plants, power plants, filter plants, bridge substructures, foundations—capable of organizing and coordinating entire project. Available May 15th, minimum salary $8500 per annum. Location south or southwest—permanent connection with reliable contractor only considered. PW-8680, Engineering News-Record.

ESTIMATOR STRUCTURAL Ornamental Miscellaneous Iron work, highly experienced, best of references desires responsible position with first class shop. PW-8713, Engineering News-Record.

CIVIL ENGINEER—graduate, licensed. 16 years experience, 10 executive, in design and construction of office, shop and laboratory buildings, hangars, processing plants and equipment, large piping, pressure vessels, heating plants, power installations, roads and sewers. Supervised 300 electrical, civil, mechanical, aeronautical engineers and draftsmen; also skilled labor. Contracting officer on all type contracts cost-plus lump-sum, and unit cost. Can write clear and concise reports, specifications and letters. References. Reply PW-8747, Engineering News-Record.

CIVIL ENGINEER, graduate, age 24, single, speaks some Spanish. Two years const. supt., one of largest chain store firms. Desires field construction position preferably South America. PW-8764, Engineering News-Record.

STRUCTURAL GRADUATE, Eight years experience seeks position as designer, checker or squad boss. Location NYC or LI. Available on two weeks' notice. Salary open. PW-8780, Engineering News-Record.

CONSTRUCTION ENGINEER—Fifteen years experience, heavy construction, refinery and power plant work, United States and South America. Speak construction Spanish. Interested in foreign work only. Available now. PW-8762, Engineering News-Record.

BUILDING: PROJECT Manager graduate Civil Engineer licensed in several states, 25 years' experience building contracts of all types and similar structures, excellent estimator, purchasing, subletting, coordinator Midwest or East. Permanent position. PW-8791, Engineering News-Record.

A COURSE OF INSTRUCTION BY MAIL IN
STRUCTURAL ENGINEERING
Thirty-ninth Year

(In the following list, Courses A, B, and C are abbreviated from our complete Structural Engineering course).
A—Public Works Structures.
B—Architectural Engineering.
C—Special Course (State Board Exams, for P.E.)
D—Structural Engineering (complete).
E—Preparatory Course (for non-technical men).

Our courses have helped thousands of men to better positions. Information sent without obligation. WRITE TODAY

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College House Offices • Harvard Square • Cambridge, Mass., U. S. A.

Napoleon once said
"An Army Marches on Its Stomach"
We Have Fed Millions
KANE INDUSTRIAL SERVICE
Industrial Feeding.
Labor Camps.
Labor Camp Equipment.
Free Employment Agencies.
30 Years' Experience in the Housing and Feeding of Men for Satisfied Clients.
Abundant Labor Supply available for Large Projects Anywhere.
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FEEDING and HOUSING
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OLYMPIC COMMISSARY CO.
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Phone HA 7-1670
SEATTLE: 316 Second Ave., South
MINNEAPOLIS: 105 Nicollett Ph: Atl 4845.

PART TIME WORK WANTED

ENGINEER-CIVIL — Registered P.E., New York desires part time structural work. Possible association small architectural office. PTWW-8654, Engineering News-Record.

SELLING OPPORTUNITIES WANTED

SALES MANAGER—Engineer. Many years experience, successful record Building industry. Will represent manufacturer or Engineering service East Coast with New York headquarters. Can take complete charge. RA-8630, Engineering News-Record.

SALES TERRITORY Wanted. Energetic established manufacturer's representative wants Missouri and/or Middle West territory. Building, mining, road supplies, tools, equipment. Graduate mining engineer with fifteen years field and sales experience with following. RA-8797, Engineering News-Record.

FOR SALE

Set (100) Metal Railroad Curves;
Triangular Boxwood Scales; Gurley Hand Level; Beam Compass; Pair Extension Dividers; Driving Instruments; Chesterman Steel Tape. All good; some new. FS-8778, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N.W., Washington 5, D.C.

LEARN TO ESTIMATE

Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

The Tamblyn System of Estimating will make a real estimator out of you in a few weeks of your spare time. We are so sure that you will want to learn it, that we will send you our complete home study course for ten days examination absolutely free. If you don't think it is the finest thing you ever saw, just return it and it won't cost you a cent. If you like it and want it, send us $8.75 when 10 days are up and $7.50 per month until $38.75 is paid.

This estimating system is based on forty years of actual construction experience. It has been sold all over the world for more than twenty years. Thousands of estimators and contractors swear by it. Our offer isn't hot air and big talk. We don't give you a diploma or a lapel button, but we do teach you down to earth estimating which will bring you profitable business.

Just send your name and address today, and we will mail you the complete course at once for your approval.

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MARTINDALE'S
BEVEL ANGLES
Time saver for Drafting Room for Bins, Towers, Hip & Valley Roof Shop Details.
Typical connections and layouts. Formulas, graphs and tables of Bevel Angles for three dimensional connections.
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Circular on request.

L.B.SMITH INC.

OFFERS

AIR COMPRESSORS

Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.

Gardner-Denver, 105 foot, with air receiver, hose reel, driven by power take-off and mounted 1941 Ford.

Gardner-Denver air-cooled 105 foot with receiver, V-Belt driven from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.

Gardner - Denver two - stage 160 ft., skid mounted.

Worthington 210 cubic foot, two-stage air-cooled, on steel wheels with Hercules diesel.

Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.

Gardner-Denver 315 cu. ft. two-stage, skid mounted, Murphy four-cylinder diesel.

Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

QUARRY EQUIPMENT & BINS

New 16 x 16 double clamshell gates.

20" x 6'6" Belt Type Magnetic Separator.

Practically new Jeffrey type VS, 28'6" centers, bucket elevator, 6 x 4 buckets, belt mounted, fully enclosed, can extend to 80'.

Link-Belt style 146 vertical centrifugal discharge bucket elevator, belt type, fully enclosed, extendable to 65'.

18 x 36 Farrell deep jaw crusher, with McLanahan 3' x 7' roll type feeder.

10 x 20 Champion No. 4½ primary jaw crusher.

10 x 7 Allis Chalmers Blake type jaw crusher.

Williams 20-S pulverizer.

Cedarapids No. 1 Kubit.

36 x 36 Jeffrey Flextooth pulverizer.

100 ton 3 compartment storage or aggregate bin with or without batcher and scales.

60 ton 2 compartment storage bin with clam shell gates.

ELECTRIC MOTORS

New & Rebuilt—All Sizes
3 to 125 HP in stock
Open and Totally Enclosed

TRUCKS—TRAILERS

1½-ton Ford & Chevrolet.

2½-ton GMC, New and rebuilt.

Van Trailers with 17' x 7'8" x 6' bodies. Five ton capacity.

2,000 gallon tanks on semi-trailer mounting.

New and rebuilt dump bodies.

DIESEL GENERATORS

7½ KW to 125 KW. Alternating and direct current.

SHOVEL

Osgood 1¾-yd diesel powered shovel with 23' boom, 17' dipper stick, 1¾-yd dipper D13000 diesel engine. Excellent condition.

GASOLINE AND DIESEL ENGINES

New JXD Hercules Gasoline.

Buda, Hercules, Hill diesels, rebuilt.

New Murphy 4 and 6 cylinder diesels.

GM 6 and 12 cylinder diesels, practically new.

New Cummins 6 cylinder diesels for Euclids.

SHOVEL ATTACHMENT

Lorain 30A chain crowd, LBS#5142, 16' boom 13'4" stick ½-yd dipper.

Lorain 40 Hi-Lift, 25' boom 19'8" stick LBS #5877, new ¾-yd dipper LBS#7750.

P&H 203A, LBS#2527, 19'6" boom 13' stick ⅝-yd dipper.

Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.

Koehring 502 with necessary parts to convert from crane to shovel, 21' boom 16' stick 1¼-yd dipper.

BACKHOE ATTACHMENT

Lorain 41 backhoe, LBS#5429, with 18' boom, 7' stick, 36" cutting width Amsco bucket. Will fit any ¾-yd Lorain with serial number over 9,000.

DRAGLINE FAIRLEADS

New Osgood ½-yd Model 200.

BACKHOE BUCKETS

¾-yd Lorain, 40, LBS#6105, 44" cutting width, teeth, sheave.

27" outside width drop bottom type LBS #1033, good condition.

26" outside width solid bottom type LBS #4377, good condition.

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.

McCaffrey Model 636 for ¾-yd to 1-yd crane.

SHOVEL DIPPERS

Bucyrus-Erie 20B, ¾-yd LBS#3801.

Lorain 41, ¾-yd, LBS #7433, new condition.

New Lima 1-yd, Amsco, LBS#2295.

Bucyrus-Erie 1¼-yd gas air, LBS#3782, fair.

Lorain 75 manganese 1¼-yd, LBS#7233, teeth and bail.

Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS#2260.

Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS#5361.

Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#6153.

Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#5763.

CONCRETE ROAD BUILDING & MISCELLANEOUS CONCRETE HANDLING EQUIPMENT

Pavers & Mixers

Ransome 34E dual drum, new October, 1943, with 36'9" boom, 1000 gallon auxiliary water tank, Cummins engine, rebuilt.

Jaeger Model 14DL, non-tilt mixer, rebuilt.

Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.

Heltzel 10'-12' finisher, rebuilt.

Blaw-Knox gas-electric 10½'-12½', rebuilt.

2 Koehring 10'-12', rebuilt.

Koehring 10'-16' finisher, rebuilt.

Concrete Spreaders

Blaw-Knox type SA 10'-15' spreader, new 1943. New condition.

Concrete Road Forms

830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
1300'—Blaw-Knox 8"x8" forms, with stakes.
445'—Heltzel 9"x8" forms, with stakes.
1430'—Heltzel 10"x8" forms, with stakes.
1010'—Blaw-Knox 10"x8" forms, with stakes.

Fine Grade Machines

Flynn surgrader 10'-12', rebuilt.

R.B. Fine Grader for 21' width, rebuilt.

Form Graders—2 of each

Cleveland formgrader, new condition.

Carr formgrader, new 1944, rebuilt.

BELT CONVEYORS

New 18"—24"—30"—36"
- "Sealed-for-life" idlers
- Lattice or channel frame
- Shipment from stock depending on length

CLAM—DRAG—SCRAPER BUCKETS

GRADERS

Caterpillar 44 hydraulically operated drawn grader, 12' blade, wt. 8,300 lbs.

York Corporation Model SR drawn grader with scarifier, 8' blade, rakes, pneumatics, wt. 7,900 lbs.

DIESEL POWERED TRACTORS

"FD" Cletrac with Buckeye blade and double drum P.C.U.

Phone **HARRISBURG, PA. 5-7331**

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SUBURB OF HARRISBURG

WE OWN THE EQUIPMENT WE ADVERTISE

SHOVELS, CRANES, DRAGLINES

Buc-Erie 120B. 5 yd. Elec. Shovel.
P & H 1055 Hi-Lift Diesel Shovel
Northwest-6 Diesel 1½ yd. Shovel
Marion 111-M Hi-Lift 3-yd. Shovel-Diesel
Link-Belt Speeder LS-80, ¾ yd. Shovel-Diesel
P&H 1225 2½ yd. Electric Shovel.
Lorain 820 Diesel crane. 40 tons. 1943.
Lima 1201 Diesel Drag. 3½ yds.
P & H 1055 Dragline Diesel 80′ boom.
P&H 855B 2 yd. Diesel Shovel.
Manitowoc 2000B 1½ yd. diesel dragline.
Lorain dragline 78 diesel 75′ boom.
Lorain MC4 moto crane. 1943. Excellent.
Lorain MC-414 Moto-Crane. 1948. New Condition
Lorain MC-4 Moto-Crane. New 1943
Lorain MC-4 Moto-Crane. Rebuilt Condition

ROAD CONTRACTORS EQUIP.

Adnun Black Top Paver 10′-12′.
Pumpcretes, 160-180-190-200.
Finisher Koehring Long. 20′—24′.
Finisher Blaw-Knox 10′—12′
Port. 500 CFM Diesel Air Compressor.
Rooter 5½ ton LaPlant-Choate.
Blaw-Knox Concrete Spreader. 20′x24′.
Cat. 12 road grader 9K series.
Rooter LaPlante Choate 3 tine RP.
Road Forms 8000 ft. 9″x9″.

ASPHALT PLANTS

B-G Bit. Concrete Model 848 Mixing.
Cedar Rapids "Speedline".
Cedar Rapids Portable 20 Ton per hr.
Cedar Rapids 4000# Model E Portable.

SPECIAL OFFERINGS

SHOVELS

Bucyrus-Erie Model 54B 2½ yd. Diesel Shovel.
Koehring Model 304 ¾ yd. Shovel. Diesel powered. New 1946.

DRAGLINE SPECIAL

Bucyrun-Erie Monaghan Model 6W, 8 yd. Diesel Dragline 150′ Boom

TRACTORS:

FACTORY NEW D-8 2U Series with D.D.P.C.U. and Bulldozer.
FACTORY NEW. International TD18 with hydraulic angledozer. 5 Available.
Caterpillar D7 Traxcavator 2T Series with 1 yd. Bucket.
Caterpillar D7 with Hydraulic Angledozer, 3T Series. Excellent Condition
Caterpillar D7, Cable controlled, 3T Series with Angledozer
Caterpillar D-2 Traxcavators with ¾ yd. Bucket with Bulldozer blade. Worked 700 hours.
Caterpillar D8, 2U series, about one year old, with D.D.P.C.U. and angledozer
Caterpillar D8, SR series, D.D.P.C.U. and angledozer blade.
International TD18, with LeTourneau double drum unit. New in late 1946.
Allis-Chalmers HD-19H with angledozer blade. New July 1948.
Int. TD18 with Heil angledozer Trail Builder with D.D.P.C.U. New Nov. 1947.

GRADERS:

Warco Motor Grader, new September 1947.
Caterpillar, Model 112 Motor Patrol. Condition Excellent.
Austin-Weston 99H New Nov. 1948. Int.-UD14 Diesel Engine.

EUCLID REAR DUMP TRUCKS:

Model 31FD New January 1946. **Model 27FD New April 1946.**
Model 27FD New April 1946. **Model 27FD New November 1946.**
NOTE: Must be sold as ONE UNIT.

TOURNAPULLS:

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American Terry stiff-leg 50 tons 90′ bm.
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Wiley 30 ton Steel Stiff-leg, 60′ boom.
Steel Guy 25 tons 110′ mast, 100′ bm.
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25 Ton American Steam & 3—20 Ton Ohio
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50 ton Industrial Brownhoist steam locomotive crane Type L, with 60′ boom, Code boiler, new August, 1948, used less than 6 months, condition like new. CAN BE PURCHASED AT SUBSTANTIAL SAVING, IMMEDIATE DELIVERY.

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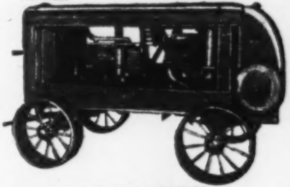

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Lima ¾ dragline diesel, 1945.
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18	pcs.	10"	BPS	Beams	54	46/48
25	pcs.	10"	BPS	Beams	57	24/35'
35	pcs.	12"	WF	Beams	36	19'10"
20	pcs.	12"	BPS	Beams	53	46/48'
21	pcs.	12"	BPS	Beams	65	36'
20	pcs.	14"	BPS	Beams	89	25/38'
10	pcs.	12"	BPS	Beams	65	50'
24	pcs.	21"	WF	Beams	112	40'
22	pcs.	24"	WF	Beams	100	30/67'
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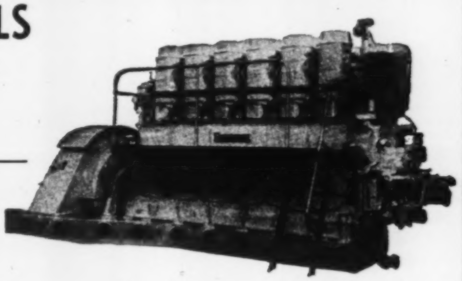

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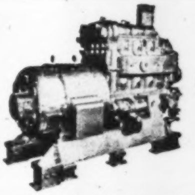

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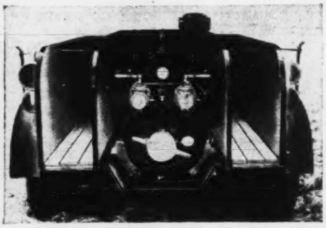

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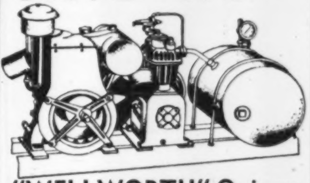

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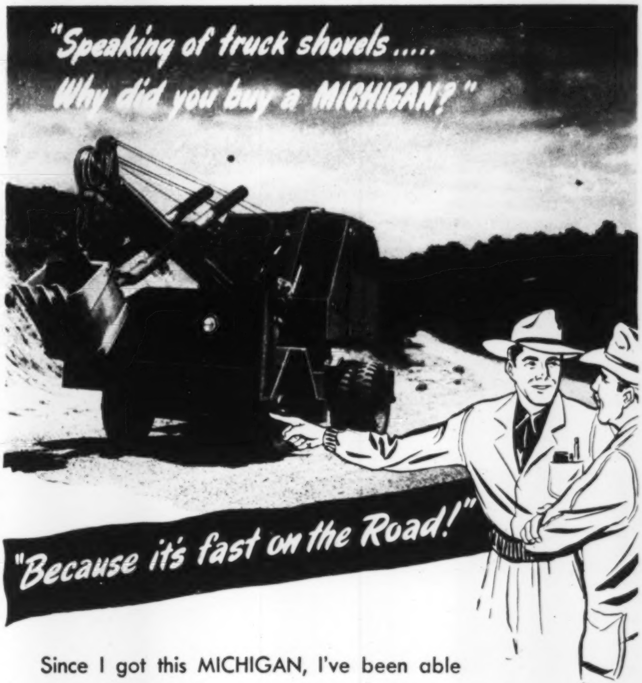
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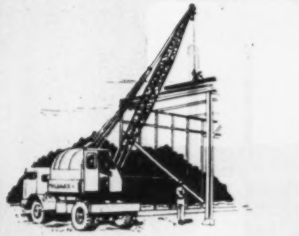

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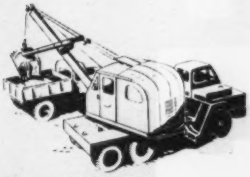

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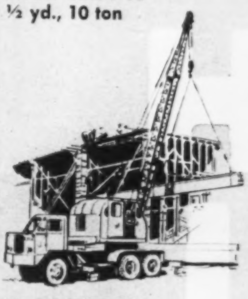

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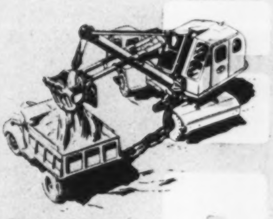

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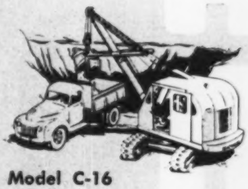

Model C-16
½ yd., 8 ton

More work on the road—less work on the grader —with TIMKEN® bearings in wheels and king pins

MAKING smooth roads from rough terrain calls for rugged, dependable equipment like this Champion D483 power grader. To insure long life, trouble-free operation, and a minimum of maintenance work, 14 Timken® tapered roller bearings are used in the king pins and wheels.

Timken bearings are made from Timken fine alloy steel—the finest ever developed for roller bearings. They normally last the life of the machine. Due to the line contact between rolls and races, Timken bearings have tremendous load-carrying capacity. Their true rolling motion and incredibly smooth surface finish enable them to operate freely and frictionlessly. Their tapered construction carries any combination of radial and thrust loads.

Because Timken bearings permit tighter closures, lubricants are retained, reducing both maintenance time and materials.

No other bearings can give you *all* the advantages of Timken bearings . . . first choice throughout industry. They're backed by 49 years of bearing research and development. Use them on all the machinery you build or buy. And always look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

THE DOMINION ROAD MACHINERY COMPANY LIMITED, GODERICH, CANADA *uses Timken bearings in king pins and wheels of Champion power graders to prevent breakdowns and cut maintenance time and cost.*

NEW TIMKEN BEARING CUTS RUN-OUT IN HALF!

Until now, the Timken "Zero" bearing has been the last word in bearing accuracy. Now Timken offers industry the "Double-Zero" bearing—*twice as accurate* as the "Zero"! Maximum run-out of the new "Double-Zero" bearing is only 75 millionths of an inch—*half* the 150 millionths run-out of the "Zero" bearing.

What an opportunity for manufacturers of machines where extreme accuracy is essential! Available in standard single row types, up to 10" O.D. Write for further information.

TIMKEN

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL | AND THRUST -⊕- LOADS OR ANY COMBINATION